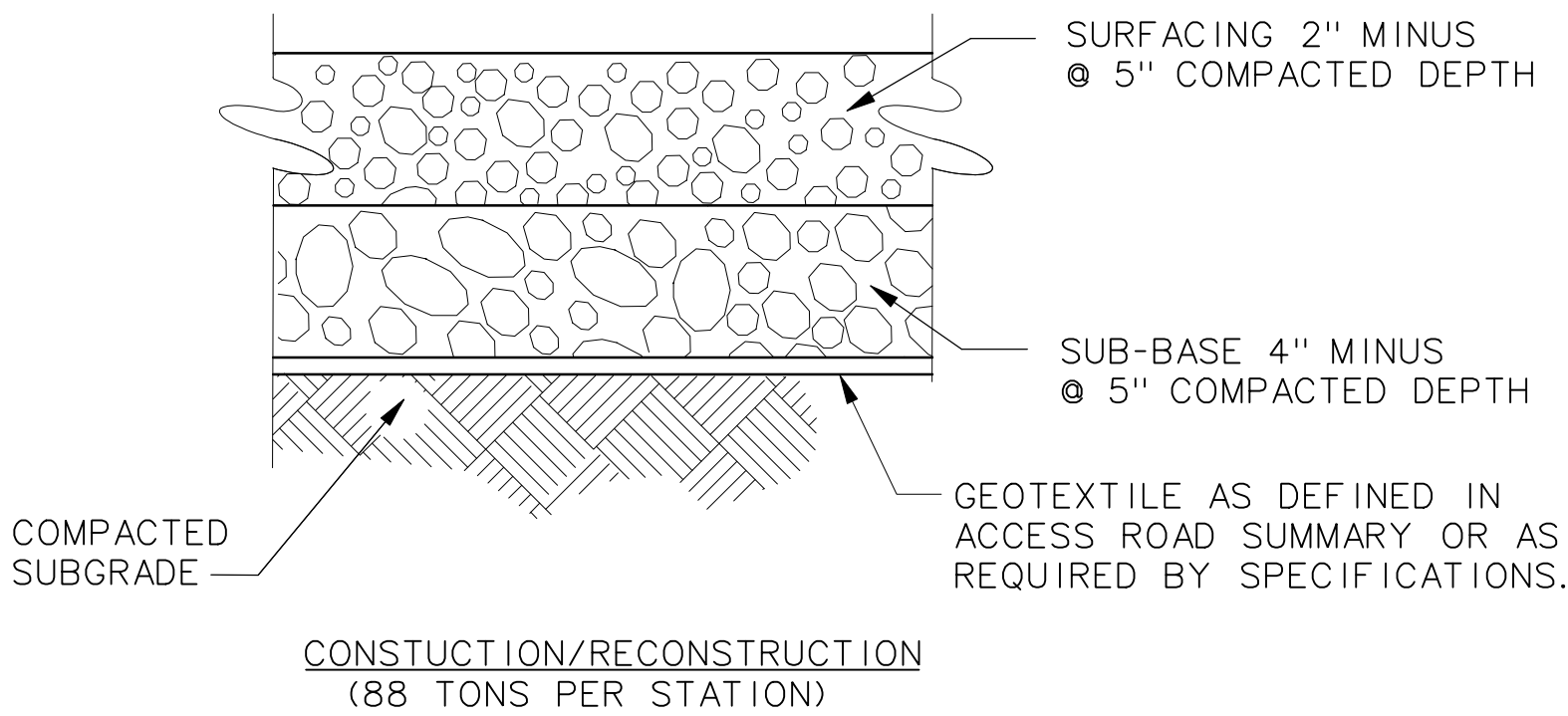
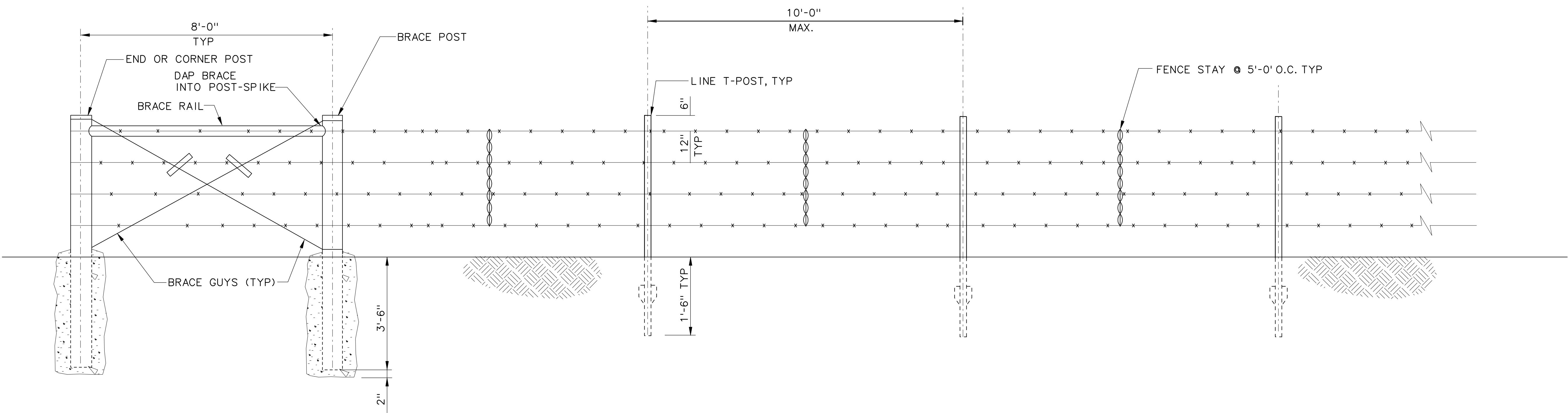


TYPICAL ROAD CROSS SECTION
NTS



DRAWING NUMBER	SHEET	TITLE
REFERENCE DRAWINGS		

NO.	*C	W.O.	00232575	COMPUTER REVISION ONLY			BY	DATE	APPROVED
* C=CONTRACT CONSTRUCTION ,FA=FORCE ACCOUNT CONSTRUCTION ,R=RECORD									
Design	HDR/MHT			UNITED STATES DEPARTMENT OF ENERGY BONNEVILLE POWER ADMINISTRATION HEADQUARTERS, PORTLAND, OREGON BIG EDDY-KNIGHT NO.1 500kv TRANSMISSION LINE PROJECT ROAD CROSS SECTION TYPICAL DETAIL					
Drawn	HDR/LBM								
Chkd	HDR/DEC								
Sub									
Rec									
Rec									
Appr									
Date	JULY 2011			SERIAL	SOURCE	SIZE	SHEET	REVISION	
	290778			LFC	A1	50	0		



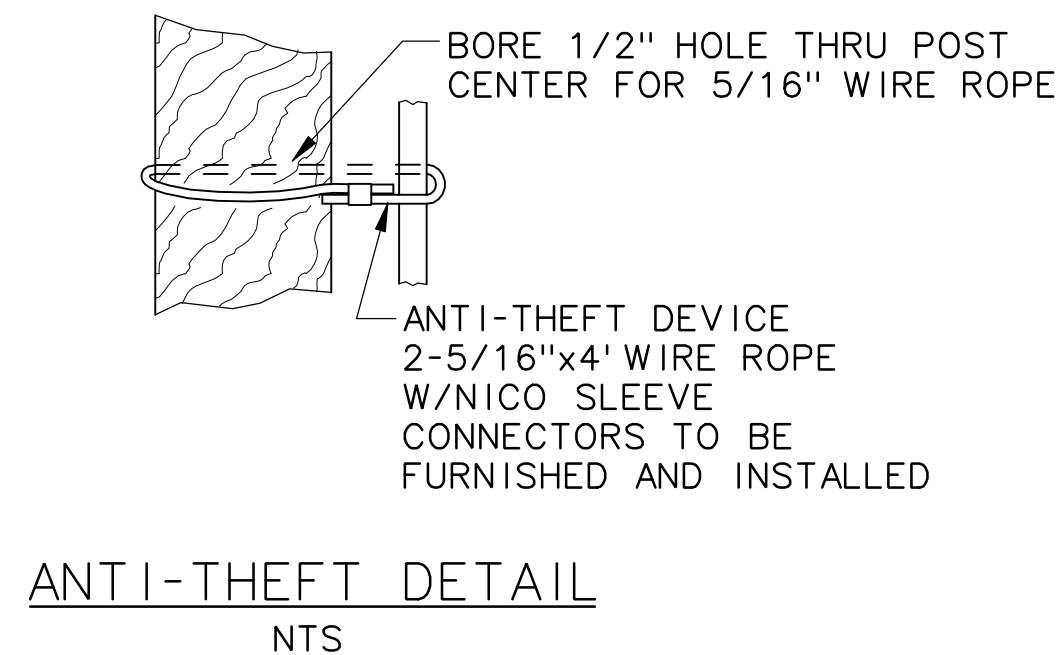
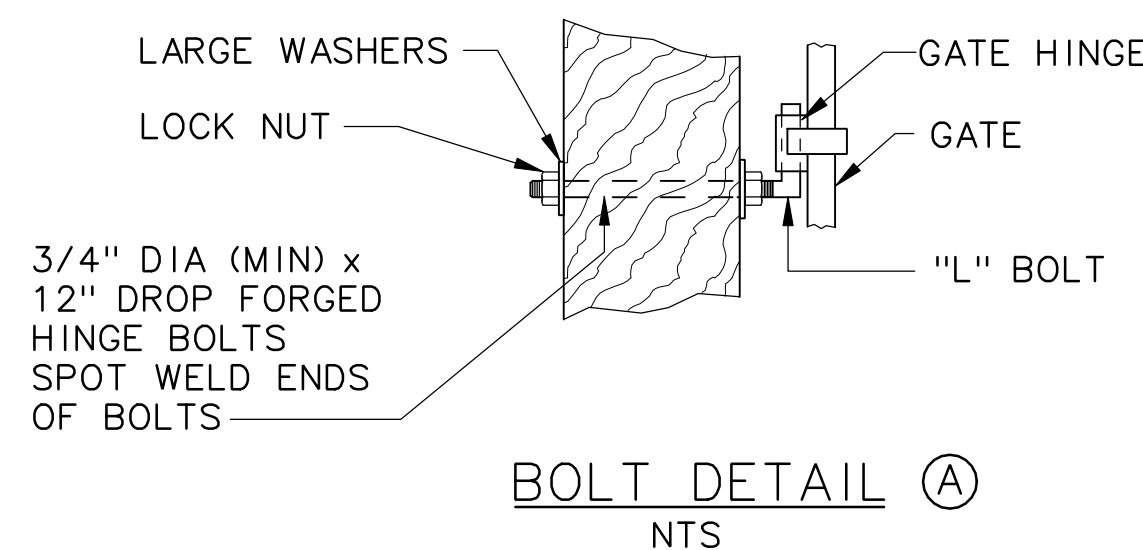
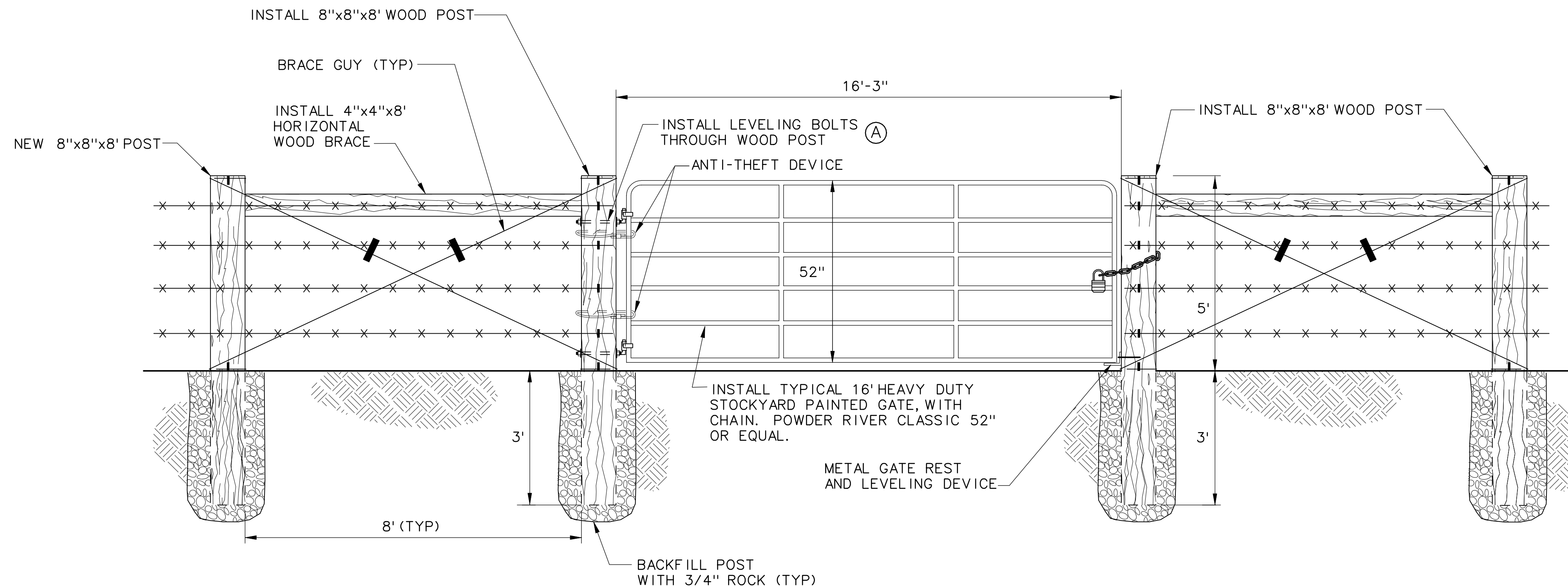
END CORNER, BRACE POST OR BRACE RAIL = 6"x6"x8' PT WOOD
BRACE GUYS = 2 STRANDS OF NO.9 GALVANIZED WIRE TWISTED TOGETHER
LINE POSTS = 6 FT STEEL POSTS
BARBED WIRE = 12* GAGE, 2 POINT

RANCH FENCE TO REPLACE FENCE DISRUPTED BY CONSTRUCTION ACTIVITIES.

RANCH FENCE TYPICAL DETAIL
NTS

DRAWING NUMBER	SHEET	TITLE
REFERENCE DRAWINGS		

NO.	*C	W.O. 00232575	COMPUTER REVISION ONLY			BY	DATE	APPROVED
* C=CONTRACT CONSTRUCTION ,FA=FORCE ACCOUNT CONSTRUCTION ,R=RECORD								
Design	HDR/MHT		UNITED STATES DEPARTMENT OF ENERGY BONNEVILLE POWER ADMINISTRATION HEADQUARTERS, PORTLAND, OREGON BIG EDDY-KNIGHT NO.1 500kv TRANSMISSION LINE PROJECT RANCH FENCE TYPICAL DETAIL					
Drawn	HDR/LBM							
Chkd	HDR/DEC							
Sub								
Rec								
Rec								
Appr			SERIAL	SOURCE	SIZE	SHEET	REVISION	
Date	JULY 2011		290778	LFC	A1	51	0	



Materials Required For One Gate		
Item	Quant	Description
1	1	16 ft tubular frame gate complete with 1" hinges, 1 gate leveling device and chain
2	2	Anti-theft device (see detail)
3	4	8"x8"x8' sawn cedar post or equal split post, PT
4	80 FT	No. 9 smooth galvanized wire (brace guys)
5	2	4"x4"x8' sawn cedar post or equal split post (wood brace), PT
6	125 FT	No. 9 gage galvanized steel barbed wire
7	1/2 LB	Common nails 20d (Galv.)
8	1/2 LB	Staples

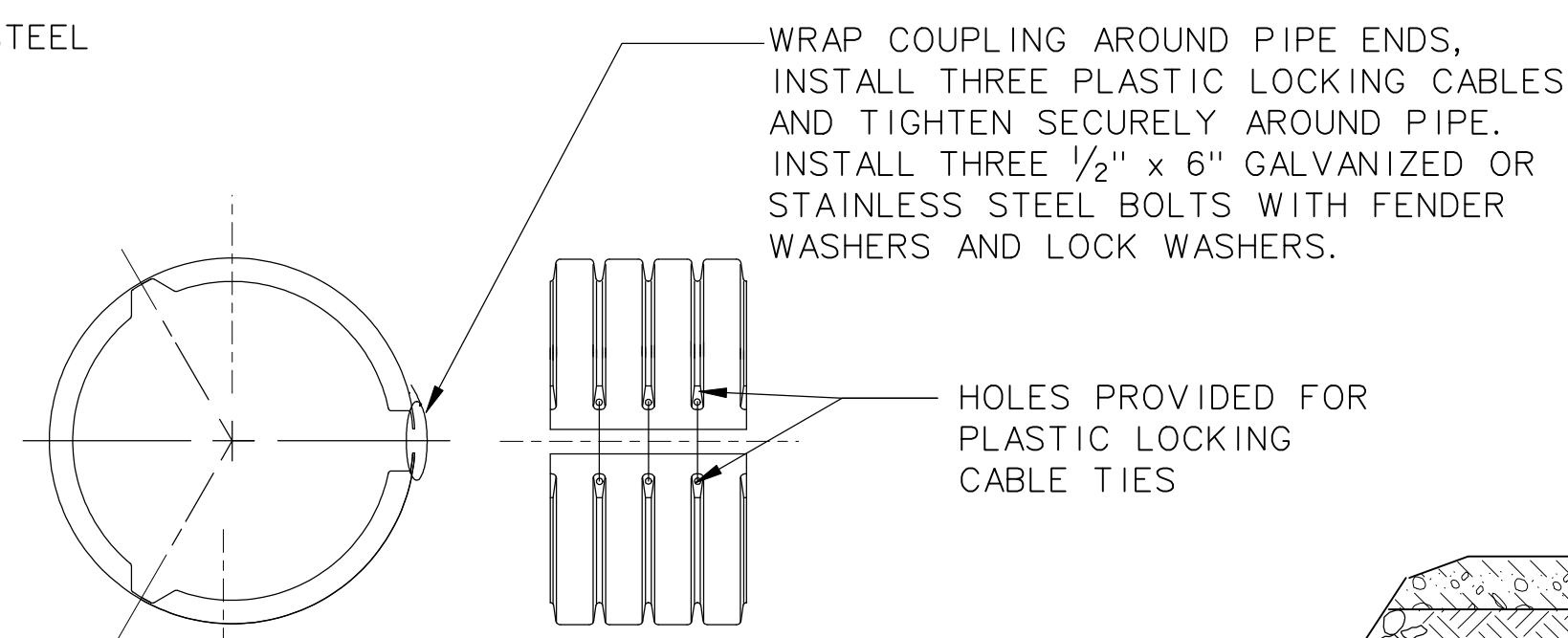
TYPICAL STOCKYARD FENCE GATE DETAIL

NTS

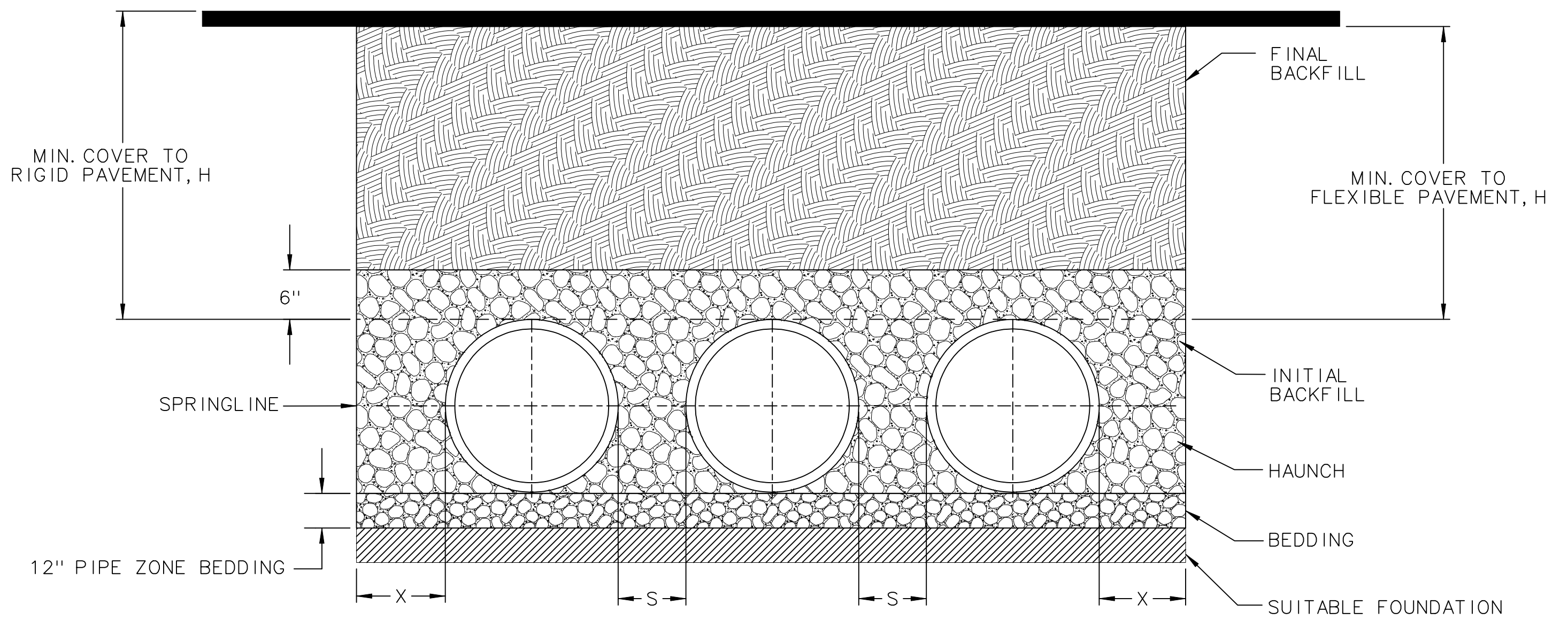
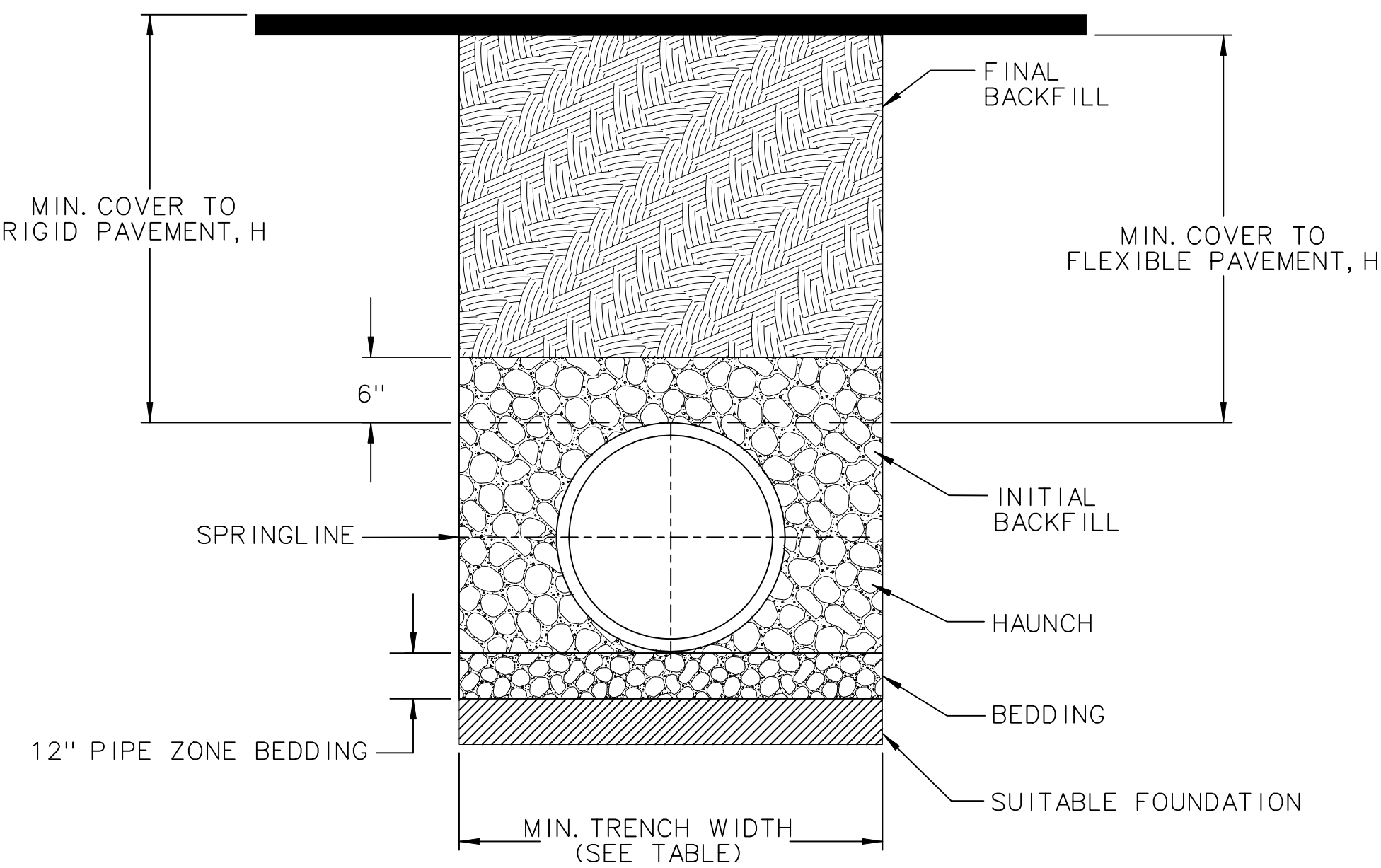
DRAWING NUMBER	SHEET	TITLE

REFERENCE DRAWINGS

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* C=CONTRACT CONSTRUCTION ,FA=FORCE ACCOUNT CONSTRUCTION ,R=RECORD							
Design	HDR/MHT						
Drawn	HDR/LBM						
Chkd	HDR/DEC						
Sub							
Rec							
Rec							
Appr							
Date	JULY 2011						
				UNITED STATES DEPARTMENT OF ENERGY BONNEVILLE POWER ADMINISTRATION HEADQUARTERS, PORTLAND, OREGON			
				BIG EDDY-KNIGHT NO.1 500kv TRANSMISSION LINE PROJECT STOCKYARD FENCE GATE TYPICAL DETAIL			
SERIAL	290778	SOURCE	LFC	SIZE	A1	SHEET	53
REVISION	0						



NO.	*C	W.O.	COMPUTER REVISION ONLY				BY	DATE	APPROVE
* C=CONTRACT CONSTRUCTION			,FA=FORCE ACCOUNT CONSTRUCTION ,R=RECORD						
Design	HDR/MHT		UNITED STATES DEPARTMENT OF ENERGY BONNEVILLE POWER ADMINISTRATION HEADQUARTERS, PORTLAND, OREGON BIG EDDY-KNIGHT NO.1 500kv TRANSMISSION LINE PROJECT CULVERT INSTALLATION TYPICAL DETAILS						
Drawn	HDR/LBM								
Chkd	HDR/DEC								
Sub									
Rec									
Rec									
Appr									
Date	JULY 2011		SERIAL	SOURCE	SIZE	SHEET	REVISION		
			290778	LFC	A1	54	0		



RECOMMENDED MINIMUM TRENCH WIDTHS

PIPE DIAM.	MIN. TRENCH WIDTH
18"	39"
24"	48"
30"	56"
36"	64"
42"	72"
48"	80"
54"	88"
60"	96"

RECOMMENDED MINIMUM SPACING

PIPE DIAM.	MIN. "X"	MIN. "S"+
18"	9"	12"
24"	10"	12"
30"	18"	15"
36"	18"	18"
42"	18"	21"
48"	18"	24"
54"	18"	27"
60"	18"	30"

+ MINIMUM SPACING ("S") MEASURED FROM OUTSIDE DIAMETER TO OUTSIDE DIAMETER.
+ ADDITIONAL PARALLEL PIPES SHALL BE SPACED "S" DISTANCE APART WITH "X" DISTANCE FROM TRENCH SIDE WALL.

NOTES:

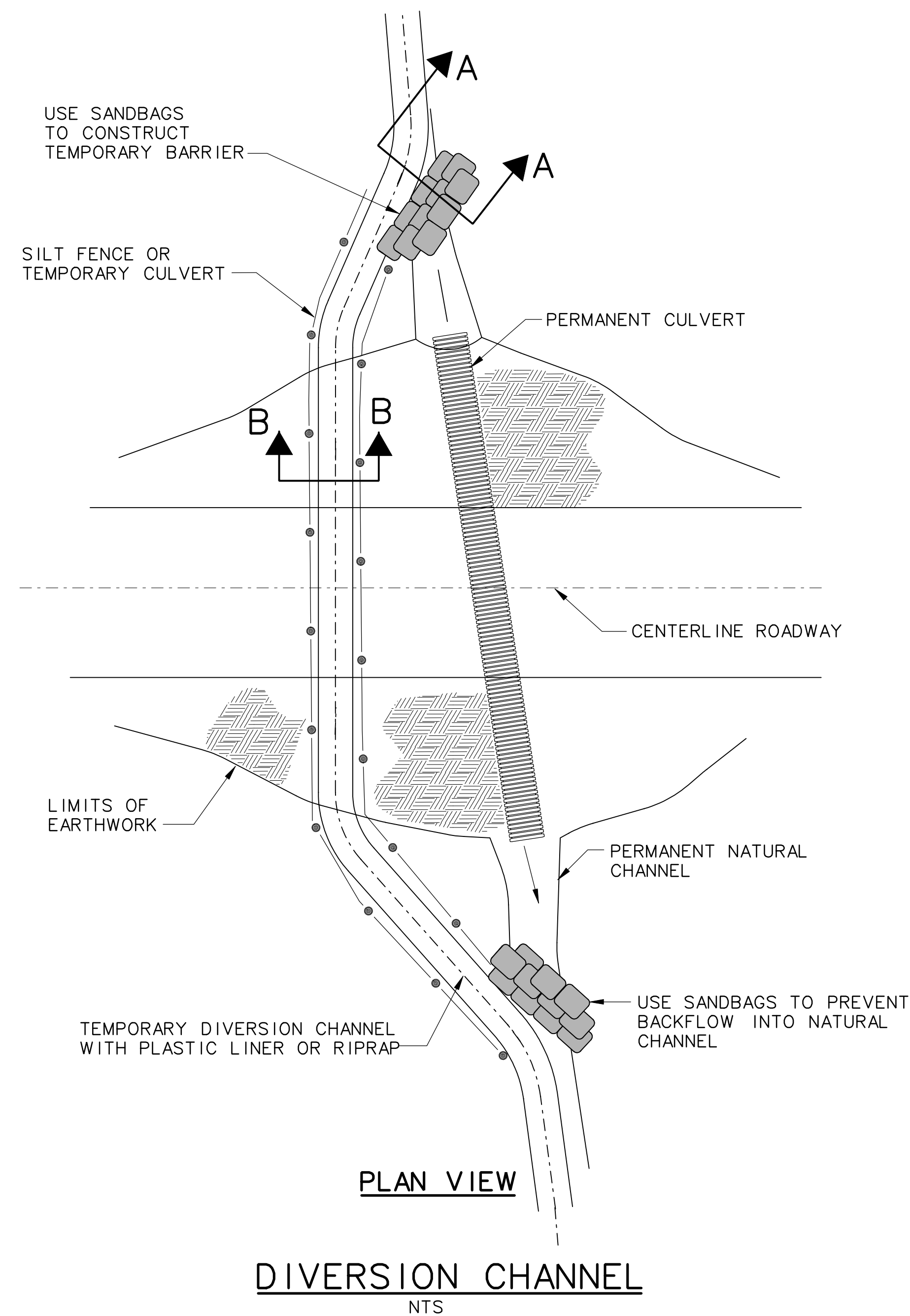
- ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION.
- MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.
- FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE COTR AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE COTR, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
- BEDDING: SUITABLE MATERIAL SHALL MEET ODOT OR WSDOT SPECIFICATION, AS APPLICABLE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER.
- INITIAL BACKFILL: SUITABLE MATERIAL SHALL MEET ODOT OR WSDOT SPECIFICATION, AS APPLICABLE, IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
- MINIMUM COVER: FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" UP TO 48" DIAMETER PIPE AND 24" OF COVER FOR 54" -60" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.

TRENCH DETAILS

NTS

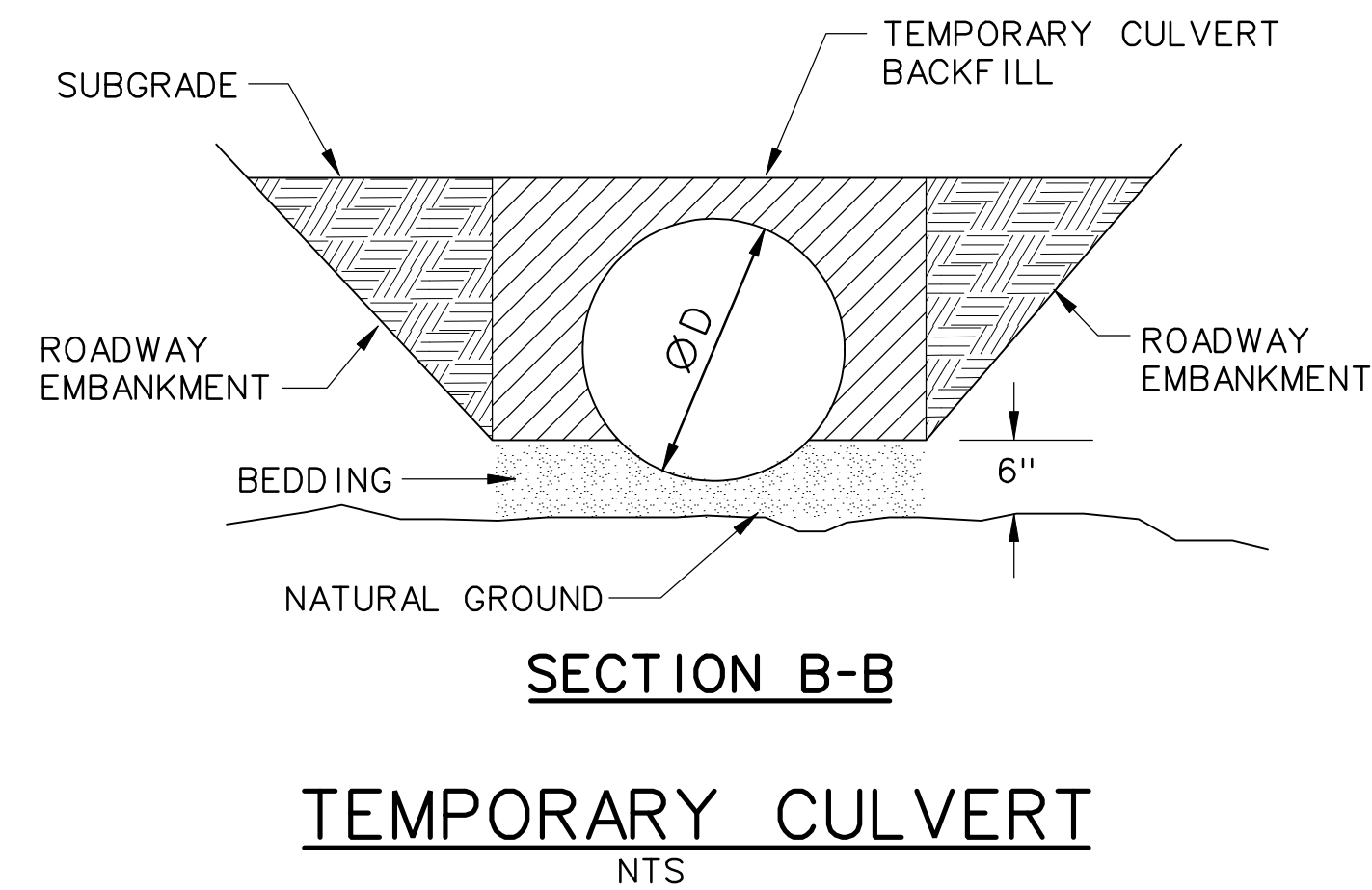
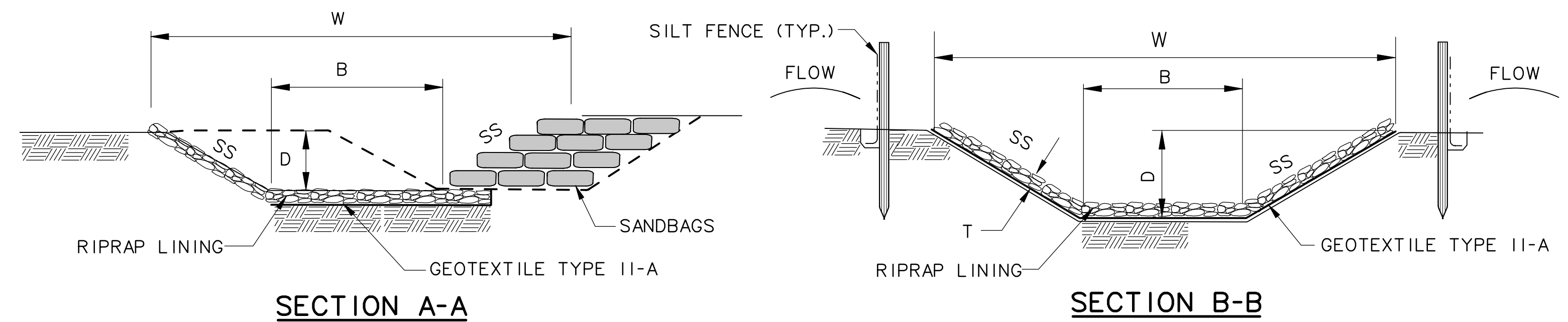
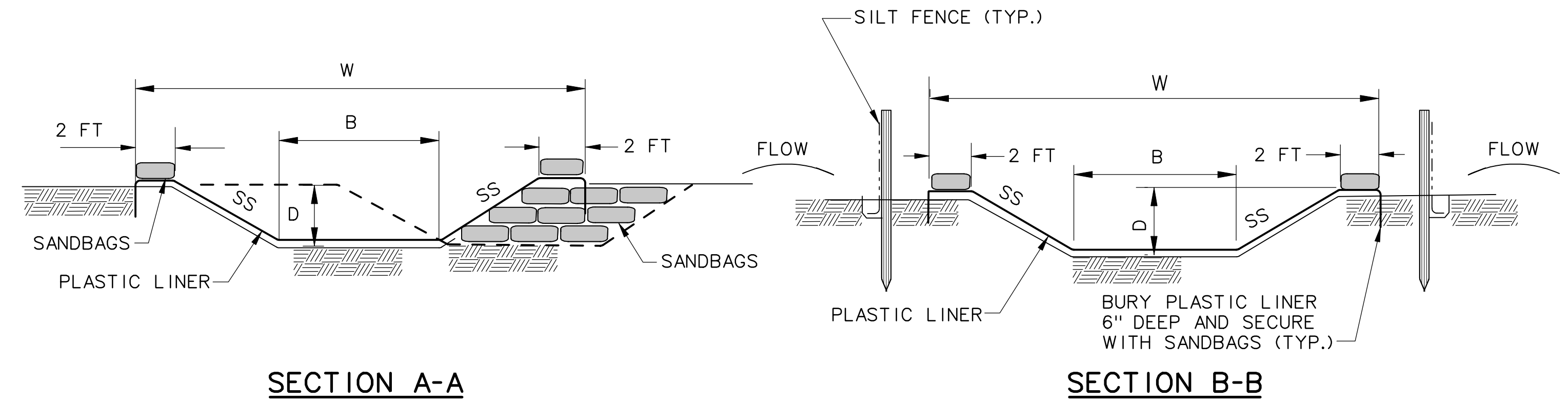
DRAWING NUMBER	SHEET	TITLE
REFERENCE DRAWINGS		

NO.	*C	W.O.	COMPUTER REVISION ONLY			BY	DATE	APPROVED
* C=CONTRACT CONSTRUCTION		,FA=FORCE ACCOUNT CONSTRUCTION ,R=RECORD						
Design	HDR/JRS		UNITED STATES DEPARTMENT OF ENERGY BONNEVILLE POWER ADMINISTRATION HEADQUARTERS, PORTLAND, OREGON BIG EDDY-KNIGHT NO.1 500kv TRANSMISSION LINE PROJECT TRENCH DETAILS FOR CULVERT INSTALLATIONS					
Drawn	HDR/CCW							
Chkd	HDR/DEC							
Sub								
Rec								
Rec								
Appr								
Date	JULY 2011		SERIAL	SOURCE	SIZE	SHEET	REVISION	
			290778	LFC	A1	55	0	



NOTES:

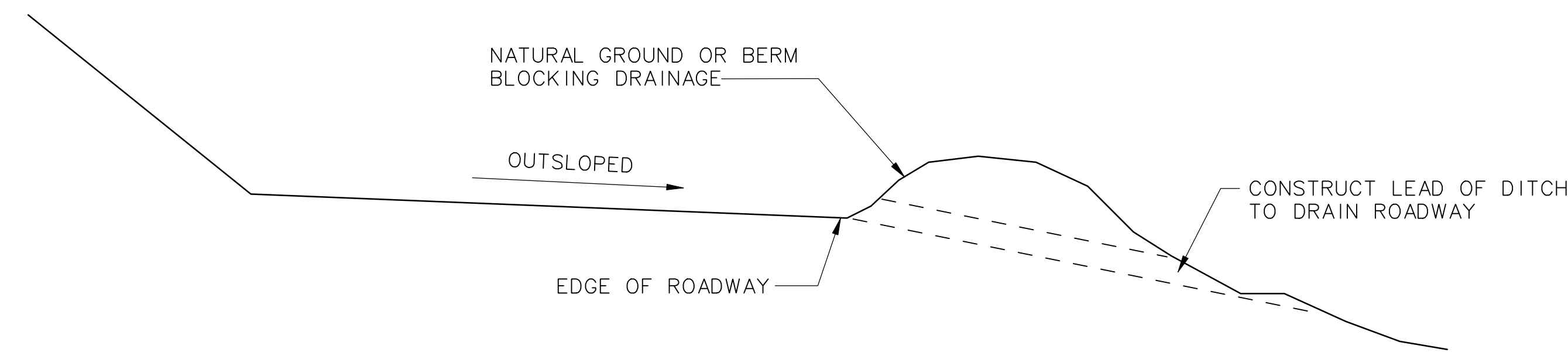
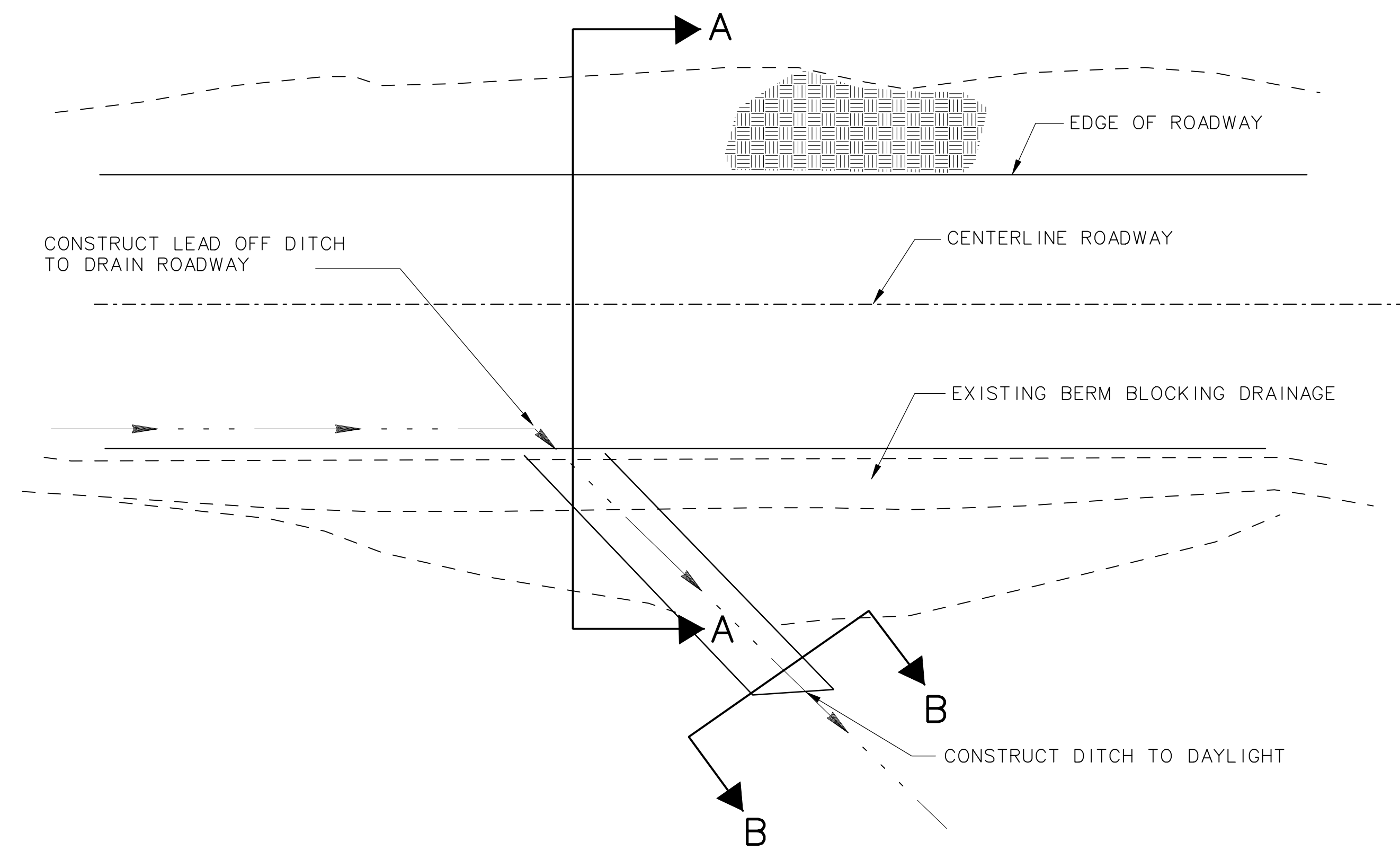
1. ADJUST DIMENSIONS (W, B, D, T AND SS) DURING CONSTRUCTION TO MEET THE REQUIREMENTS FOR STEAM SIZE AND FLOW.
2. USE PLASTIC LINER OR RIPRAP ALONG THE ENTIRE LENGTH AND WIDTH OF THE TEMPORARY DIVERSION CHANNEL.
3. CONSTRUCT CHANNEL AT THE MINIMUM GRADE OF 0.5%.
4. DO NOT CONSTRUCT WITH LONGITUDINAL JOINTS IF USING A PLASTIC LINER. BURY THE UPSTREAM EDGE OF THE LINER A MINIMUM OF 6" DEEP AND SECURE WITH RIPRAP OR SANDBAGS.
5. COMPACT TEMPORARY CULVERT BACKFILL USING ONE OF THE METHODS LISTED IN THE SPECIFICATIONS.



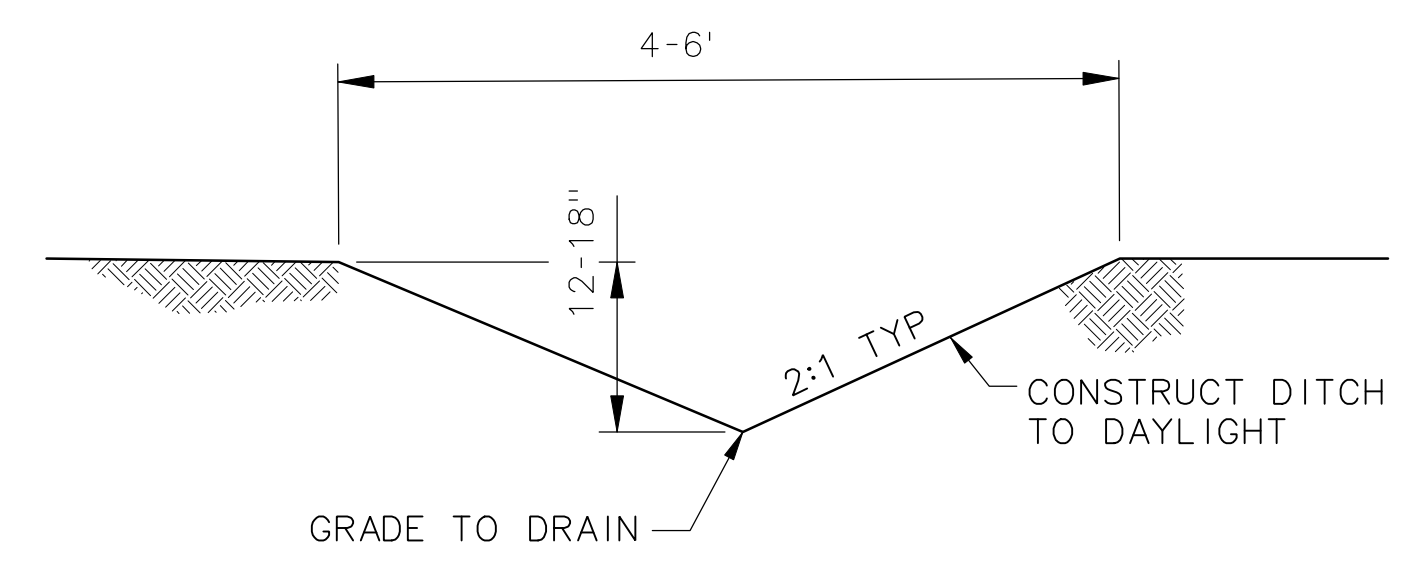
DRAWING NUMBER	SHEET	TITLE

REFERENCE DRAWINGS

NO.	*C	W.O.	COMPUTER REVISION ONLY	BY	DATE	APPROVED
		00232575				
* C=CONTRACT CONSTRUCTION ,FA=FORCE ACCOUNT CONSTRUCTION ,R=RECORD						
Design		HDR/MHT	UNITED STATES DEPARTMENT OF ENERGY BONNEVILLE POWER ADMINISTRATION HEADQUARTERS, PORTLAND, OREGON BIG EDDY-KNIGHT NO.1 500kv TRANSMISSION LINE PROJECT CULVERT DIVERSION TYPICAL DETAIL			
Drawn		HDR/LBM				
Chkd		HDR/DEC				
Sub						
Rec						
Rec						
Appr						
Date		JULY 2011	SERIAL	SOURCE	SIZE	SHEET
			290778	LFC	A1	56
						REVISION
						0



SECTION A-A

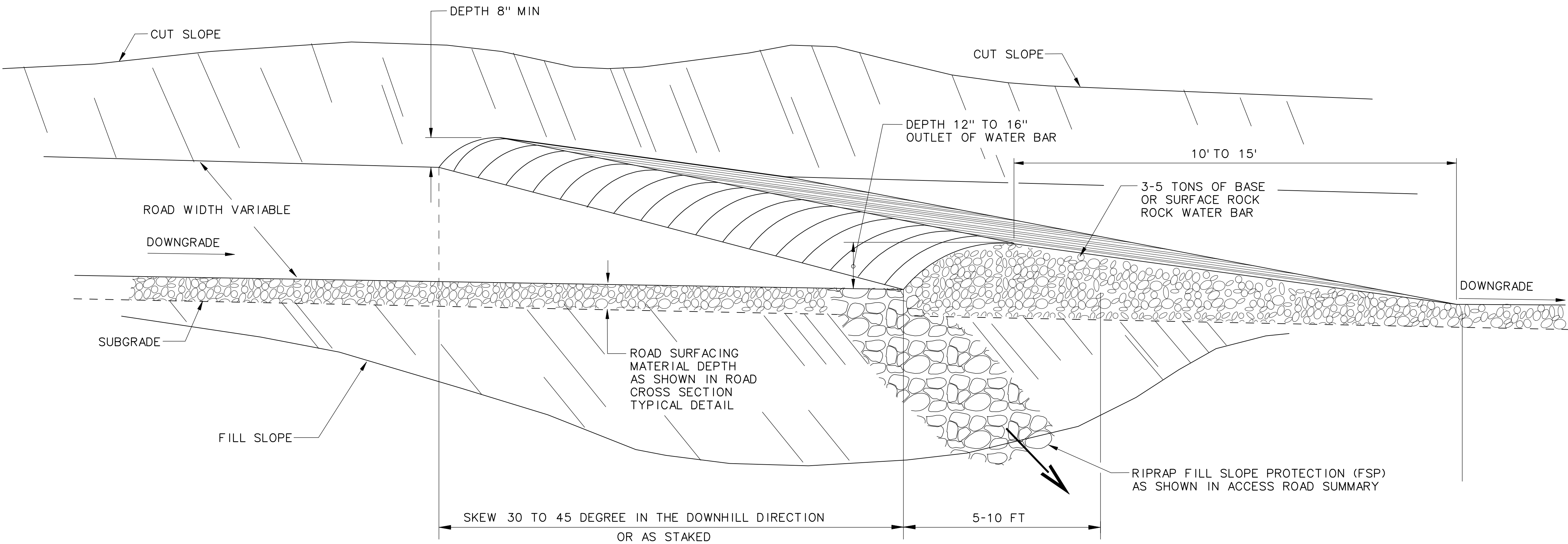


SECTION B-B

LEAD OFF DITCH DETAIL FOR ROAD DRAINAGE
(AS NEEDED) NTS

DRAWING NUMBER	SHEET	TITLE
REFERENCE DRAWINGS		

NO.	*C	W.O.	00232575	COMPUTER REVISION ONLY	BY	DATE	APPROVED
* C=CONTRACT CONSTRUCTION ,FA=FORCE ACCOUNT CONSTRUCTION ,R=RECORD							
Design	HDR/MHT			UNITED STATES DEPARTMENT OF ENERGY			
Drawn	HDR/LBM			BONNEVILLE POWER ADMINISTRATION			
Chkd	HDR/DEC			HEADQUARTERS, PORTLAND, OREGON			
Sub				BIG EDDY-KNIGHT NO.1			
Rec				500kv TRANSMISSION LINE			
Appr				PROJECT			
Date	JULY 2011			LEAD OFF DITCH TYPICAL DETAIL			
SERIAL	290778			SOURCE	SIZE	SHEET	REVISION
				LFC	A1	57	0



NOTES:

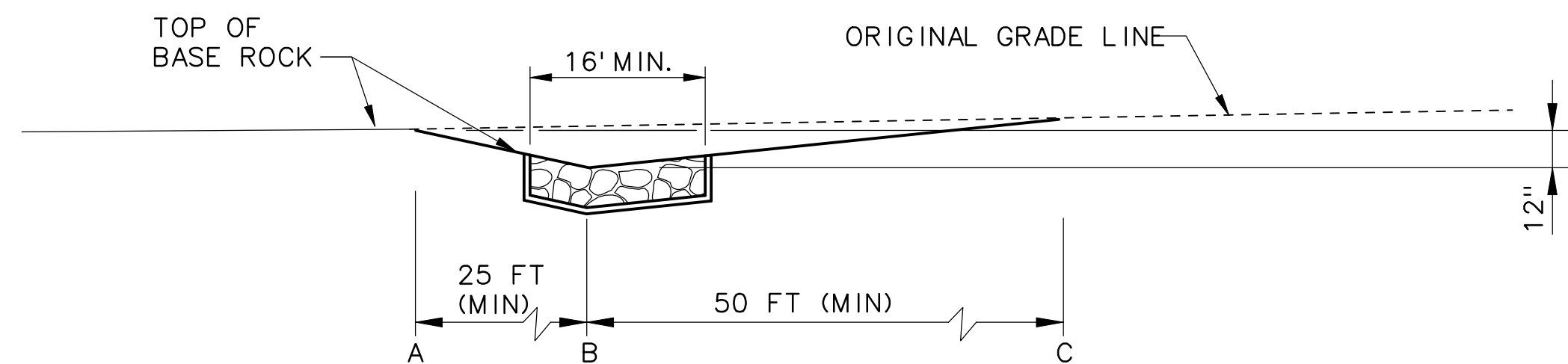
- 1. BEGIN WATER BARS AT THE INTERSECTION OF THE ROADBED AND CUT SLOPES, AND RUN ACROSS THE ENTIRE WIDTH OF THE ROADBED.
- 2. ENSURE WATER BARS HAVE A FREE FLOWING OUTLET FOR DRAINAGE.
- 3. WHEN STAKES OR FLAGGING ARE USED TO LOCATE WATER BARS, THEY DESIGNATE THE OUTLET LOCATION OF THE WATER BAR.
- 4. ENSURE THAT WATER BARS ALLOW FOR PASSAGE OF A STANDARD 4 WHEEL DRIVE PICKUP TRUCK.
- 5. SEE SPECIFICATIONS FOR SPACING.

SLOPE	INTERVAL
3%	670'
5%	400'
10%	200'
15%	135'
20%	100'

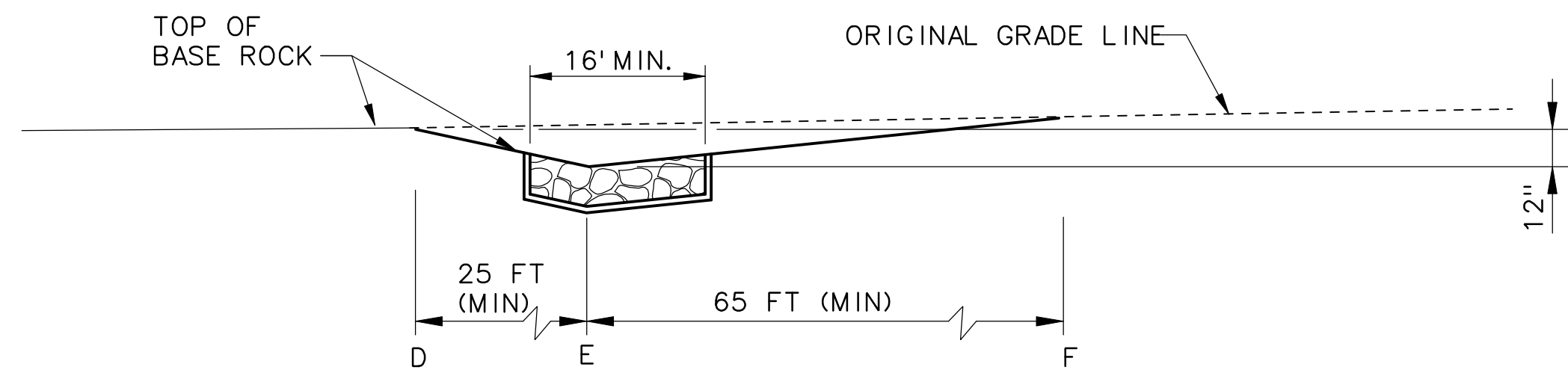
TYPICAL ROCK WATER BAR DETAIL
NTS

DRAWING NUMBER	SHEET	TITLE
REFERENCE DRAWINGS		

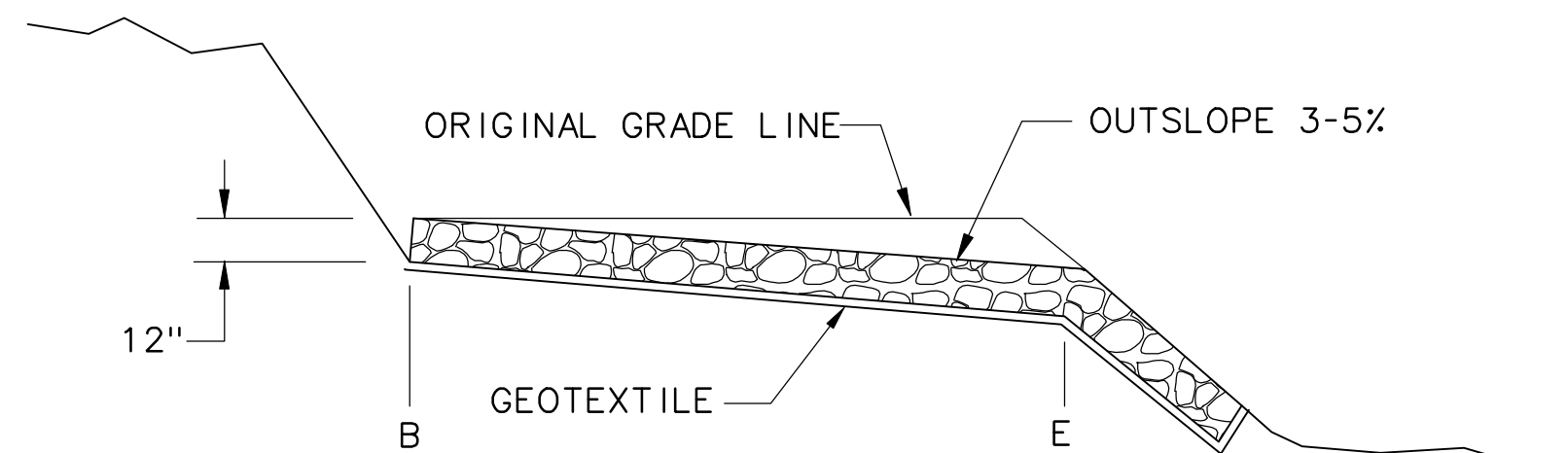
NO.	*C	W.O.	COMPUTER REVISION ONLY			BY	DATE	APPROVED
* C=CONTRACT CONSTRUCTION ,FA=FORCE ACCOUNT CONSTRUCTION ,R=RECORD								
Design		HDR/MHT		UNITED STATES DEPARTMENT OF ENERGY BONNEVILLE POWER ADMINISTRATION HEADQUARTERS, PORTLAND, OREGON BIG EDDY-KNIGHT NO.1 500kv TRANSMISSION LINE PROJECT ROCK WATER BAR TYPICAL DETAIL				
Drawn		HDR/LBM						
Chkd		HDR/DEC						
Sub								
Rec								
Appr				SERIAL	SOURCE	SIZE	SHEET	REVISION
Date		JULY 2011		290778	LFC	A1	58	0



ROAD PROFILE ALONG A-B-C OF DRAIN DIP DITCH SIDE)
NTS

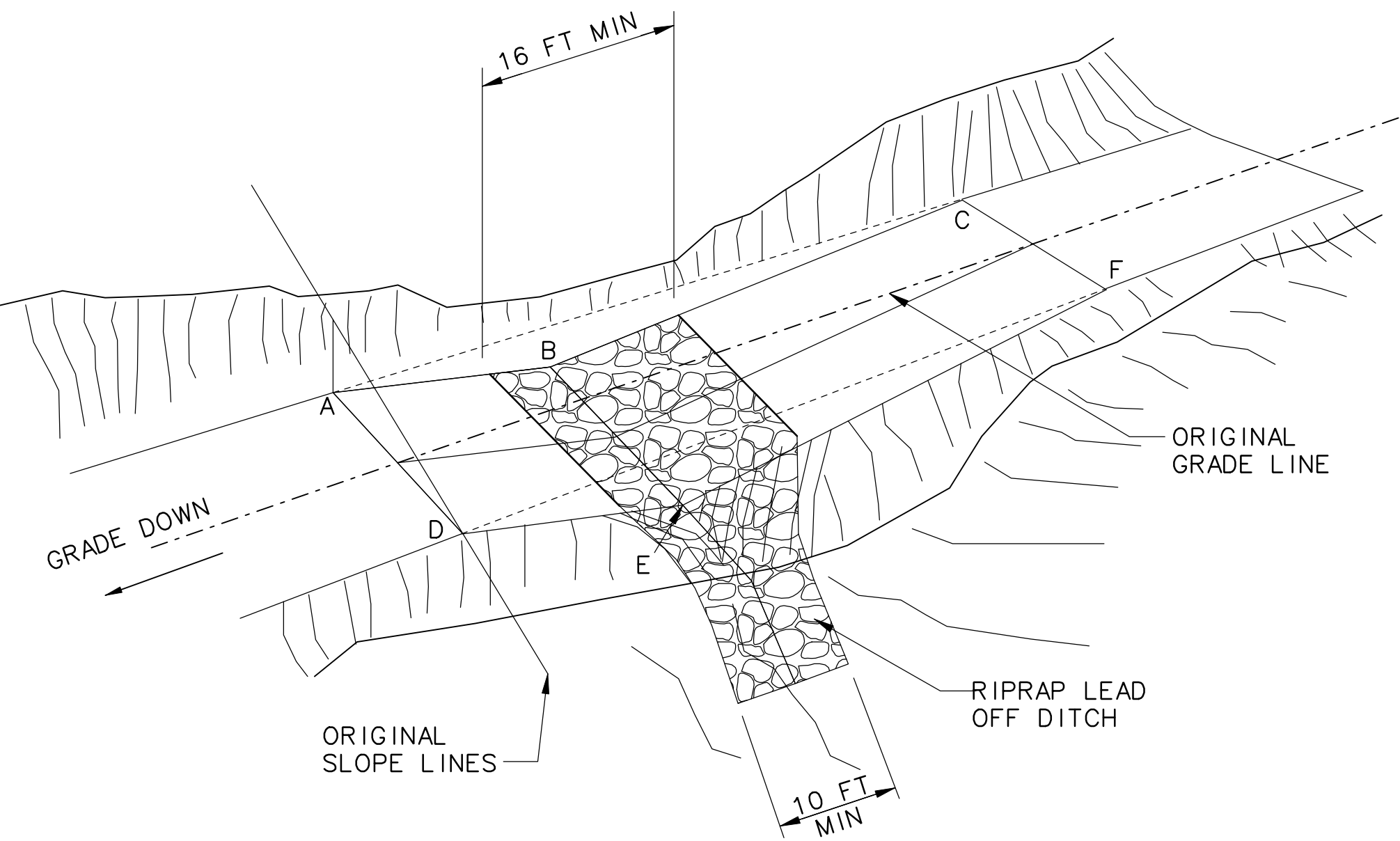


ROAD PROFILE ALONG D-E-F OF DRAIN DIP (OUTLET SIDE)
NTS



SUBGRADE
NTS

ROCK SPILL APRON 16 FT WIDE WITH
RIPRAP MATERIAL TO TOE OF FILL
AS SHOWN IN THE ACCESS ROAD SUMMARY



PERSPECTIVE VIEW
NTS

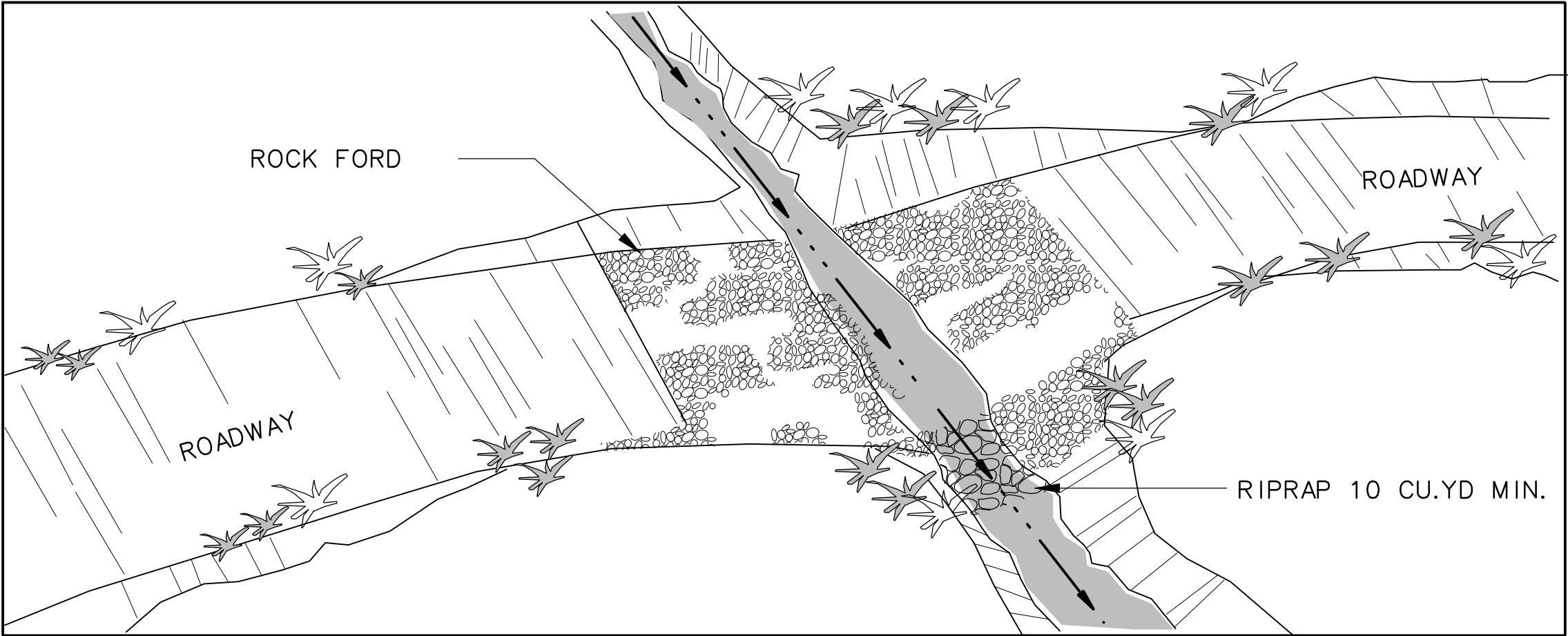
- NOTE:
- PLAN OF DIP SHOWN IS FOR AN OUTSLOPED ROAD.
- DIPS MAY BE EITHER INSLOPED OR OUTSLOPED.
- WHEN INSLOPED, DISCHARGE DIPS INTO A CULVERT, DROP INLET, OVERSIDE DRAIN, OR DRAINAGE DITCH.
- WHEN OUTSLOPED, DISCHARGE DIPS INTO AN OVERSIDE DRAIN OR ONTO NATURAL GROUND.
- THE MINIMUM CROSS GRADE (B-E) IN THE CENTERLINE OF THE DIP SHALL BE 4% GREATER THAN THE ORIGINAL ROAD GRADE.
- SKEW LINE B-E AS NEEDED OR TO FIT LOW POINT IN DRAW, IF LOCATED IN NATURAL DRAIN.
- DRAIN DIPS ARE PROPOSED AT THE FOLLOWING:
1. INSTALLED IN ROADWAY SAG LOCATIONS.
 2. TO CONVEY RUNOFF TO DOWNSTREAM CHANNEL WHERE UPSTREAM CHANNEL IS NOT PRESENT AT EDGE OF ROADWAY. FOR THESE LOCATIONS, DRAIN DIP SHALL ALIGN WITH DOWNSTREAM CHANNEL.
 3. TO CONVEY RUNOFF COLLECTED IN A CONSTRUCTED DITCH OR ALONG TOE OF SLOPE ACROSS ROADWAY WHERE THE DITCH/TOE OF SLOPE DAYLIGHTS.

TYPICAL ROLLING DRAIN DIP
NTS

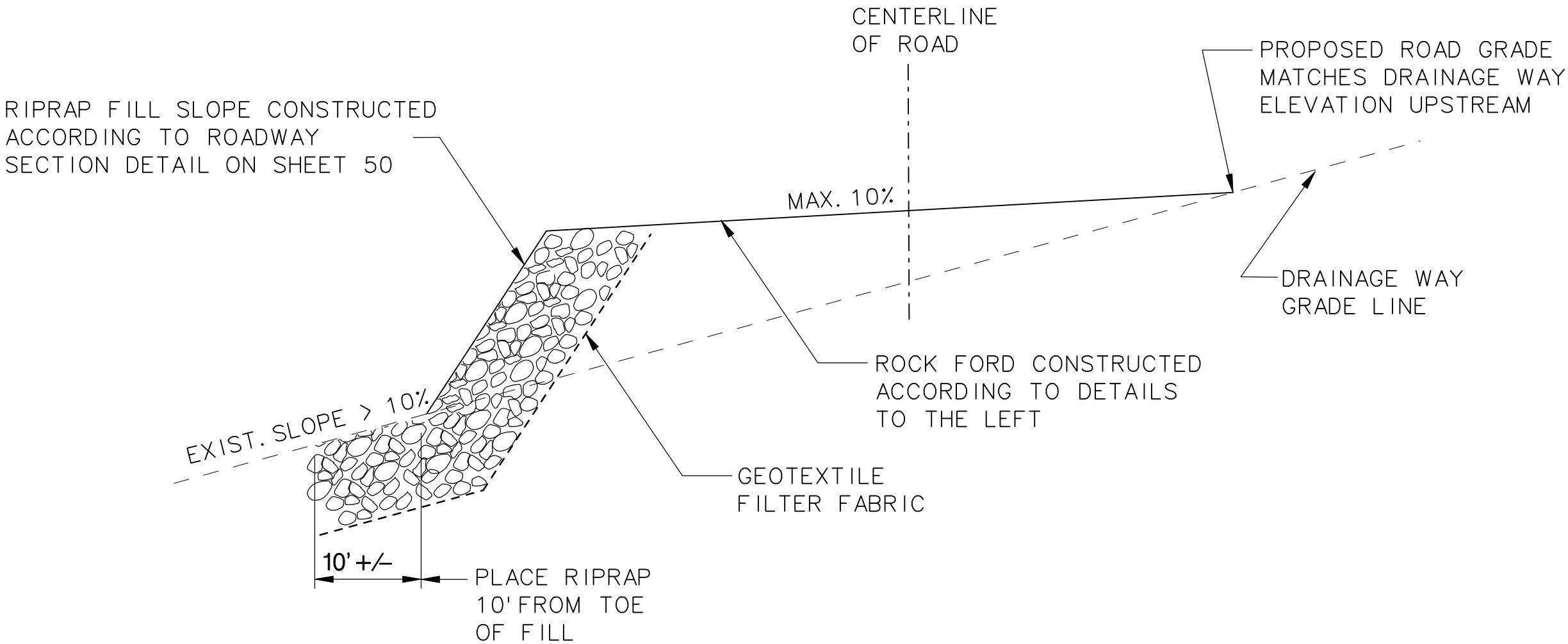
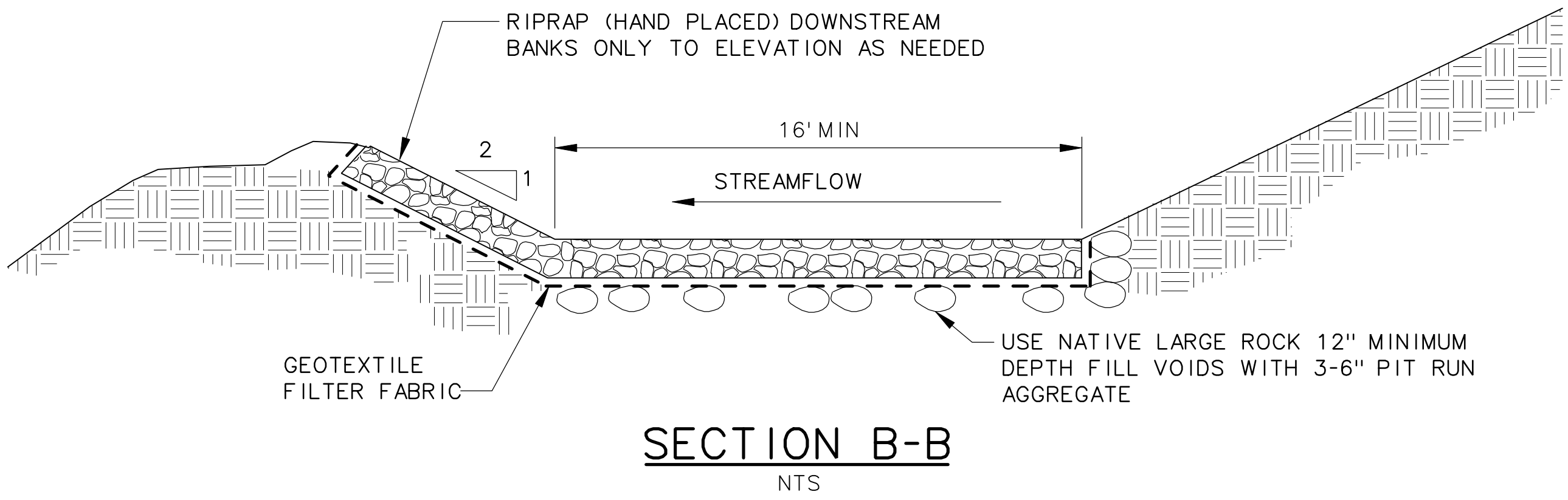
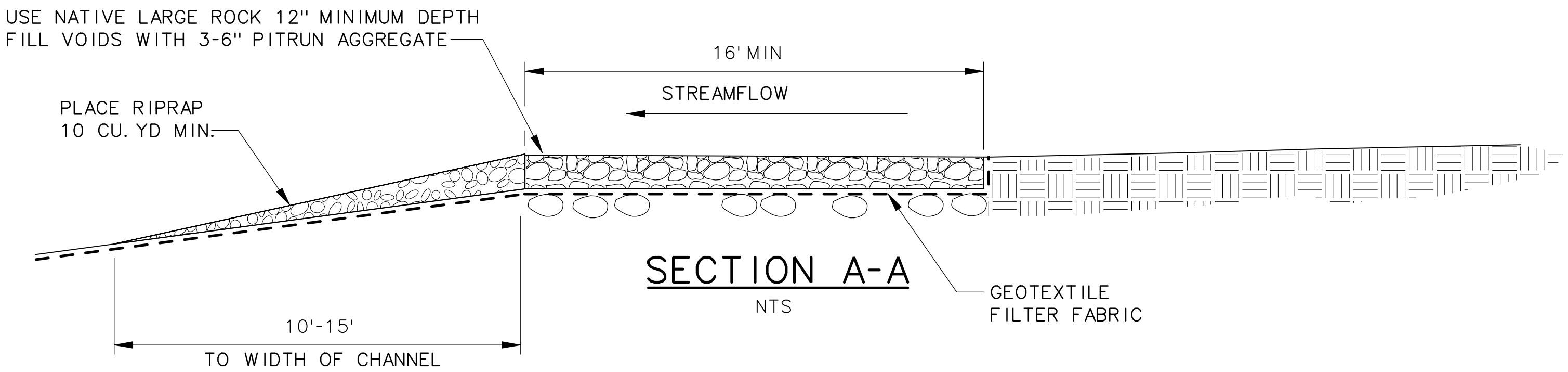
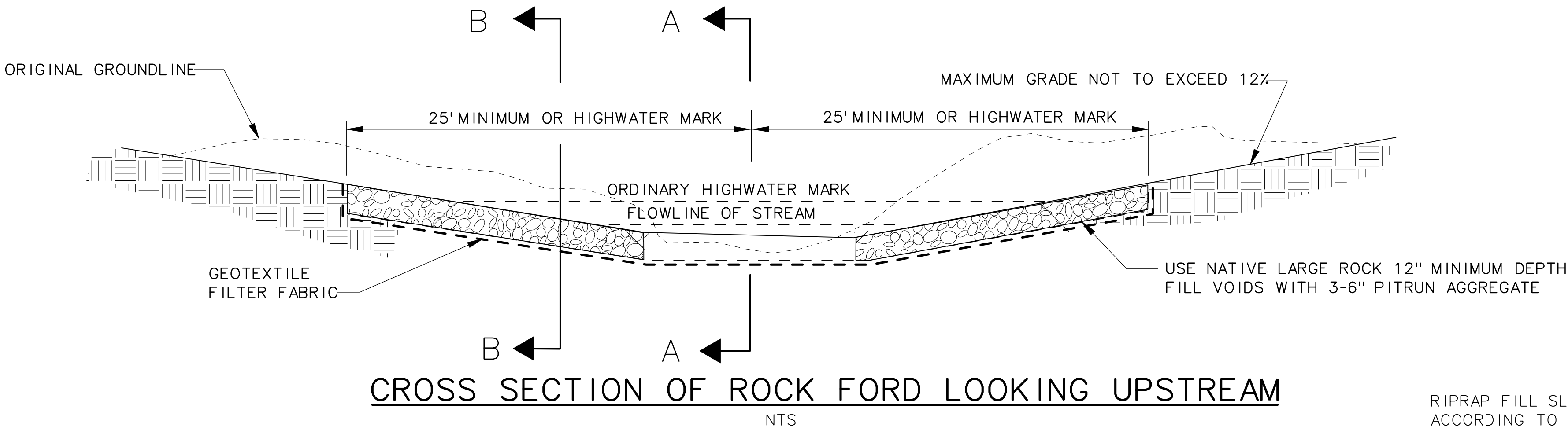
DRAWING NUMBER	SHEET	TITLE
REFERENCE DRAWINGS		

NO.	*C	W.O. 00232575	COMPUTER REVISION ONLY			BY	DATE	APPROVED
* C=CONTRACT CONSTRUCTION ,FA=FORCE ACCOUNT CONSTRUCTION ,R=RECORD								
Design	HDR/MHT		UNITED STATES DEPARTMENT OF ENERGY BONNEVILLE POWER ADMINISTRATION HEADQUARTERS, PORTLAND, OREGON BIG EDDY-KNIGHT NO.1 500kv TRANSMISSION LINE PROJECT ROLLING DRAIN DIP TYPICAL DETAIL					
Drawn	HDR/LBM							
Chkd	HDR/DEC							
Sub								
Rec								
Rec								
Appr								
Date	JULY 2011		SERIAL	SOURCE	SIZE	SHEET	REVISION	
			290778	LFC	A1	59	0	

ROCK FORD DETAIL
 (TYP) NTS

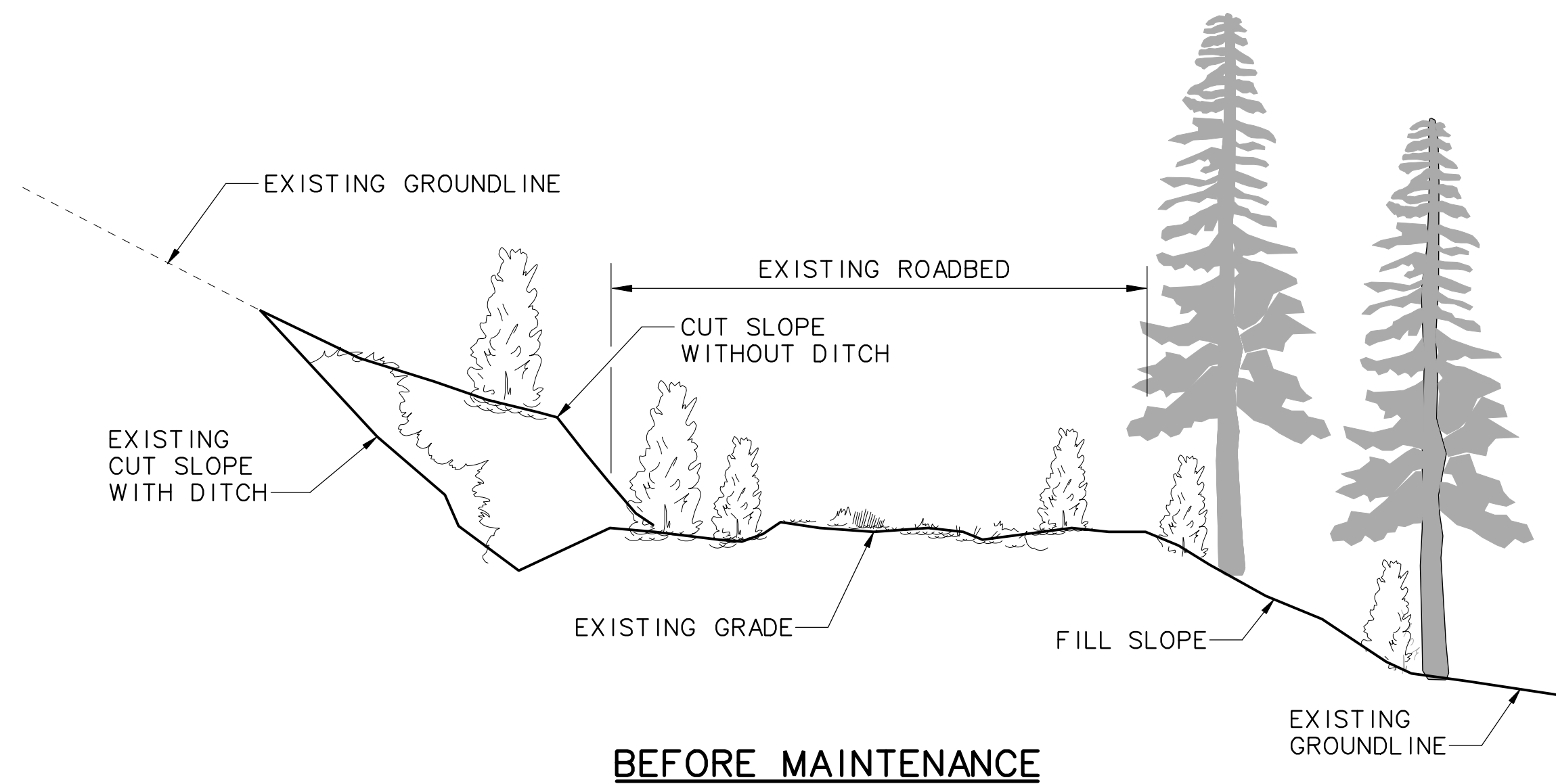


- NOTE:
1. EXCAVATE APPROACHES AND FORD TO 12" MINIMUM BELOW FINISH GRADE.
 2. PLACE LOOSE NATIVE ROCK RIPRAP TO MINIMUM COMPACTED DEPTH OF 12"
 3. PLACE 3-6" MINUS CRUSHED OR PIT RUN AGGREGATE IN FORD ONLY ENOUGH TO FILL VOIDS IN LOOSE RIPRAP TO MAKE A DRIVEABLE SURFACE.
 4. RIPRAP (MACHINE OR HAND PLACE) DOWNSTREAM BANKS - AND OUTFALL AT FLOW LINE AS DIRECTED BY THE COTR.

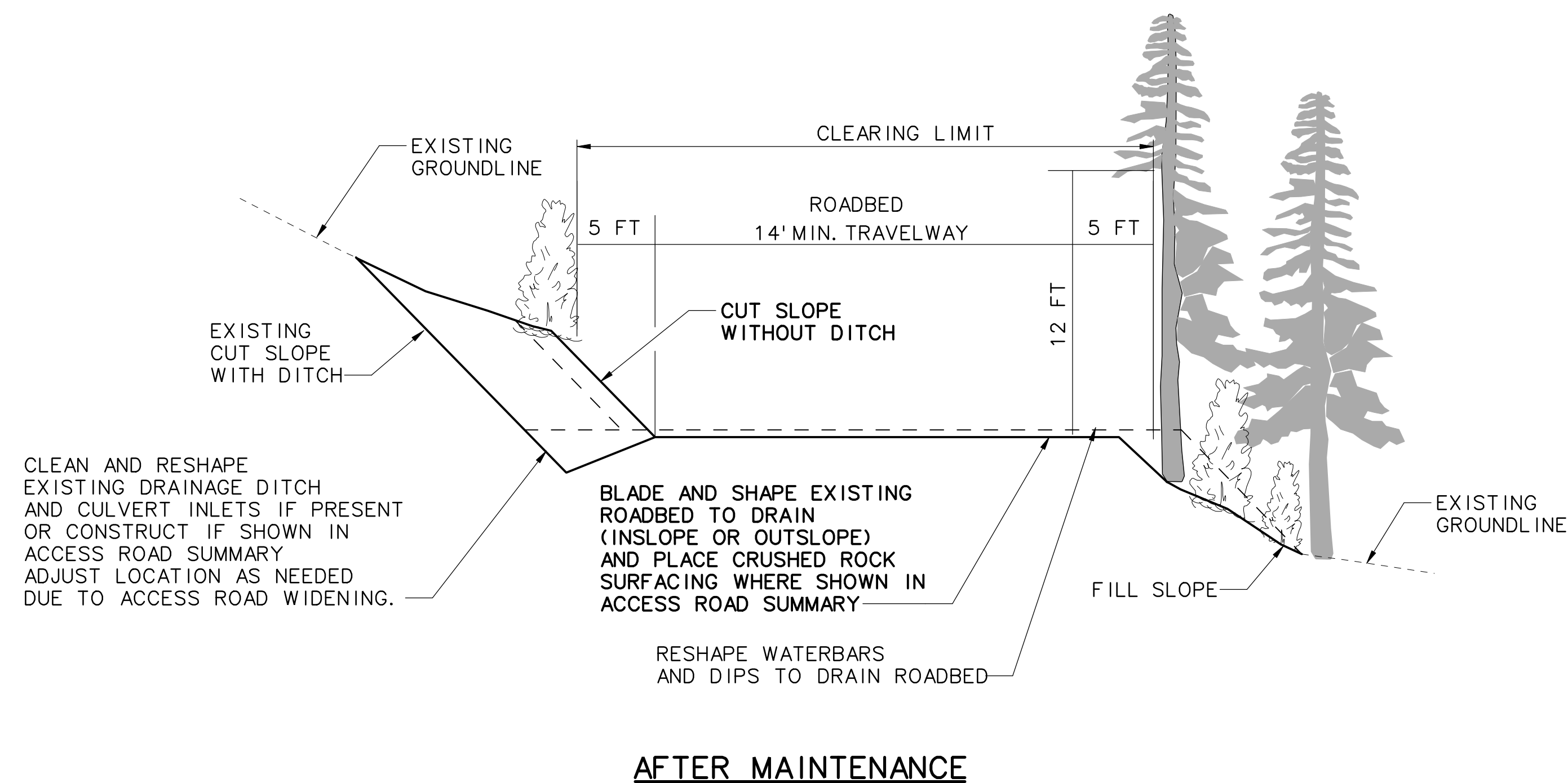


DRAWING NUMBER	SHEET	TITLE
REFERENCE DRAWINGS		

NO.	*C	W.O.	00232575	COMPUTER REVISION ONLY	BY	DATE	APPROVED
* C=CONTRACT CONSTRUCTION ,FA=FORCE ACCOUNT CONSTRUCTION ,R=RECORD							
Design	HDR/MHT						
Drawn	HDR/LBM						
Chkd	HDR/DEC						
Sub							
Rec							
Appr							
Date	JULY 2011						
				UNITED STATES DEPARTMENT OF ENERGY BONNEVILLE POWER ADMINISTRATION HEADQUARTERS, PORTLAND, OREGON			
				BIG EDDY-KNIGHT NO.1 500kv TRANSMISSION LINE PROJECT ROCK FORD DETAILS			
SERIAL	290778	SOURCE	LFC	SIZE	A1	SHEET	60
REVISION	0						



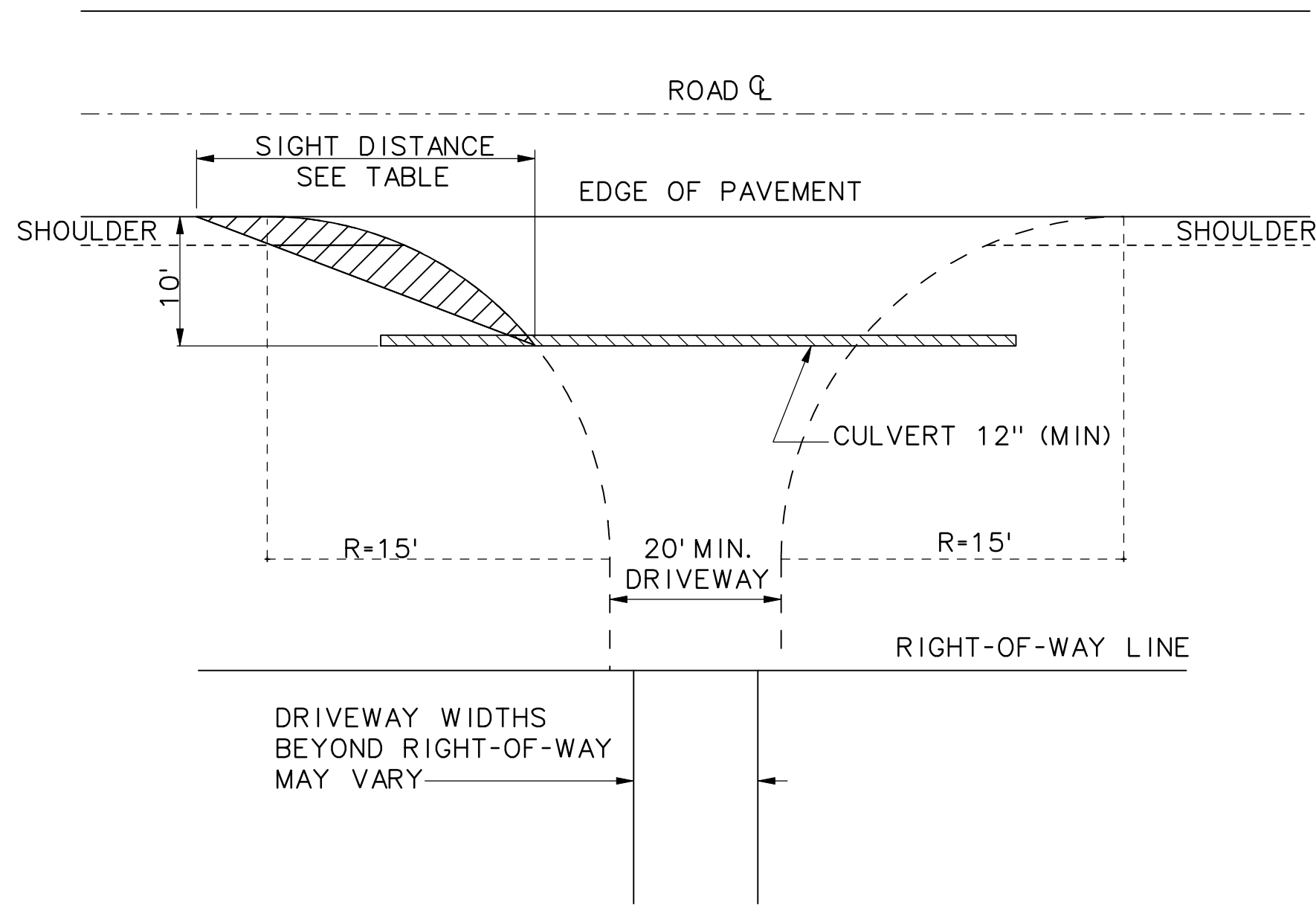
- NOTES:
1. REMOVE PLANTS AND TREES WITHIN CLEARING LIMITS SHOWN OR MARKED ON THE GROUND.
 2. BLADE AND SHAPE EXISTING ROADBED TO SPECIFIED DIMENSIONS.
 3. RESHAPE EXISTING WATERBARS, DIPS, OR OTHER EXISTING DRAINAGE STRUCTURES TO DRAIN ROADBED.
 4. CLEAN AND RESHAPE ROADWAY DITCHES AND CULVERT INLETS AND OUTLETS.
 5. INSTALL ADDITIONAL WATERBARS, DIPS OR OTHER DRAINAGE STRUCTURES AS SHOWN IN ACCESS ROAD SUMMARY.
 6. PLACE CRUSHED ROCK SURFACING IN AREAS AS SHOWN IN ACCESS ROAD SUMMARY.
 7. VARY SHAPES AND DIMENSIONS TO FIT LOCAL CONDITIONS.



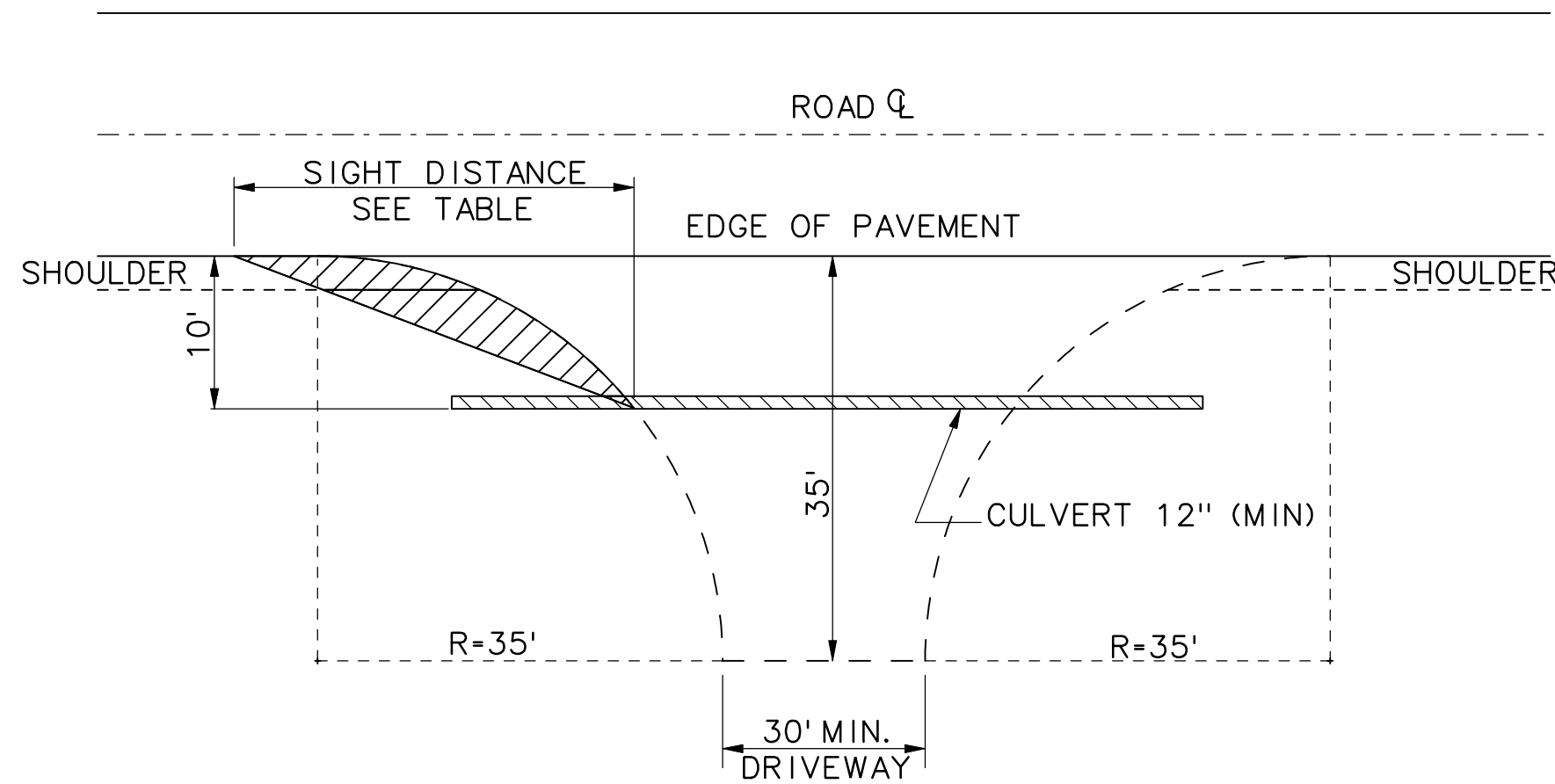
ROAD REPAIR AND MAINTENANCE DETAIL
NTS

DRAWING NUMBER	SHEET	TITLE
REFERENCE DRAWINGS		

NO.	*C	W.O.	COMPUTER REVISION ONLY			BY	DATE	APPROVED
* C=CONTRACT CONSTRUCTION ,FA=FORCE ACCOUNT CONSTRUCTION ,R=RECORD								
Design	HDR/MHT		UNITED STATES DEPARTMENT OF ENERGY BONNEVILLE POWER ADMINISTRATION HEADQUARTERS, PORTLAND, OREGON					
Drawn	HDR/LBM							
Chkd	HDR/DEC		BIG EDDY-KNIGHT NO.1 500kv TRANSMISSION LINE PROJECT ROAD REPAIR AND MAINTENANCE TYPICAL DETAIL					
Sub								
Rec								
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Appr								
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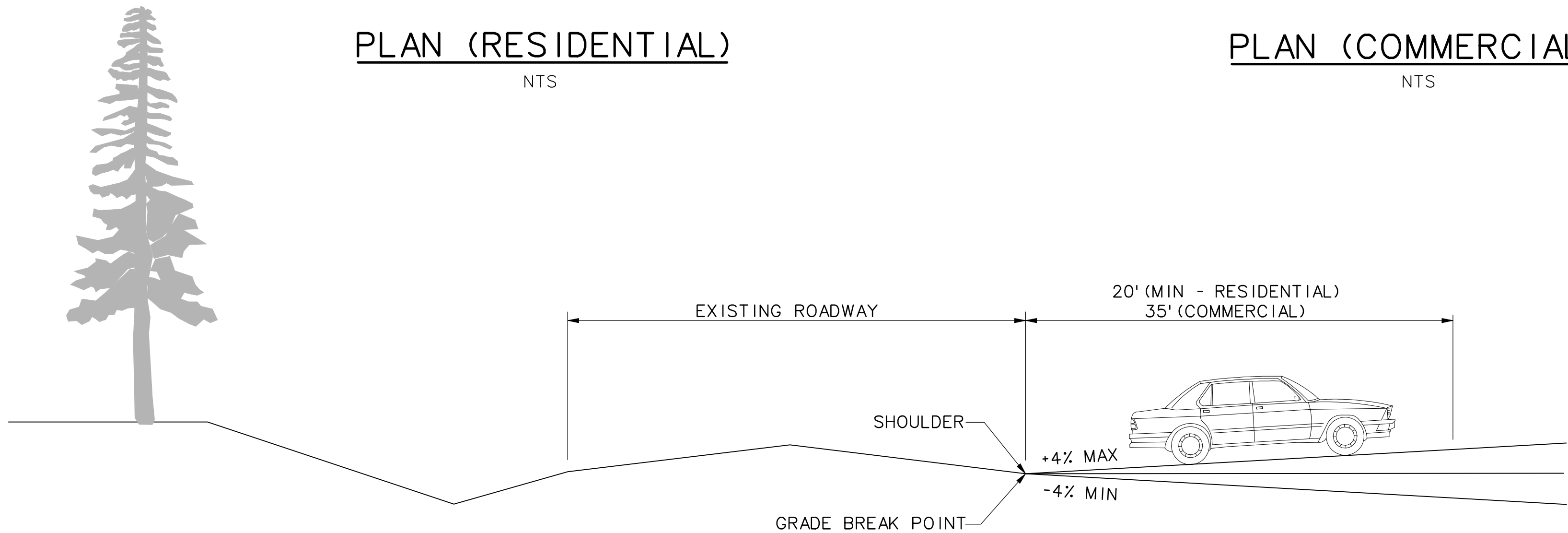


PLAN (RESIDENTIAL)
NTS



PLAN (COMMERCIAL)
NTS

Sight Distance Table (feet)						
Posted Speed (mph)	20	25	30	35	40	50
Sight Distance	150	150	180	230	280	380

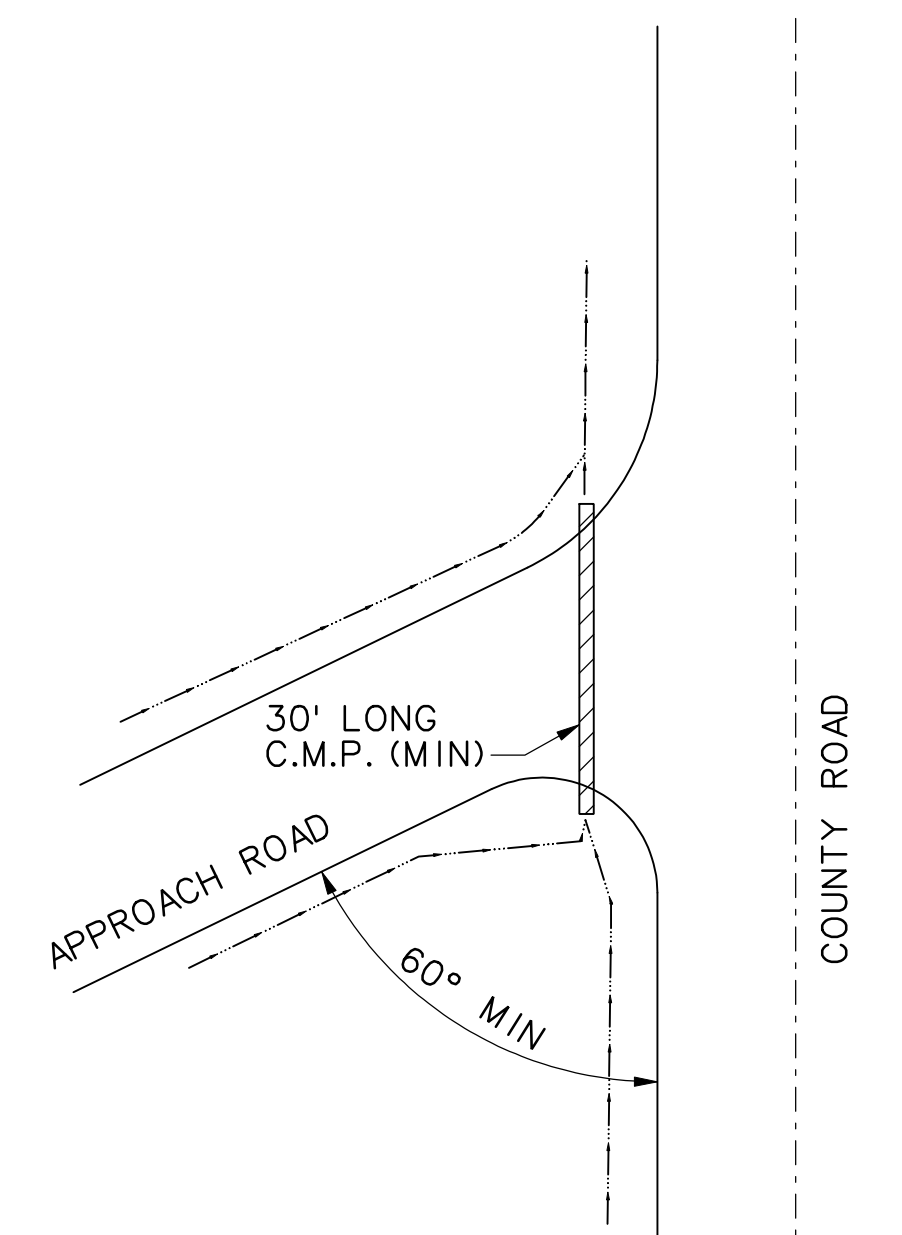
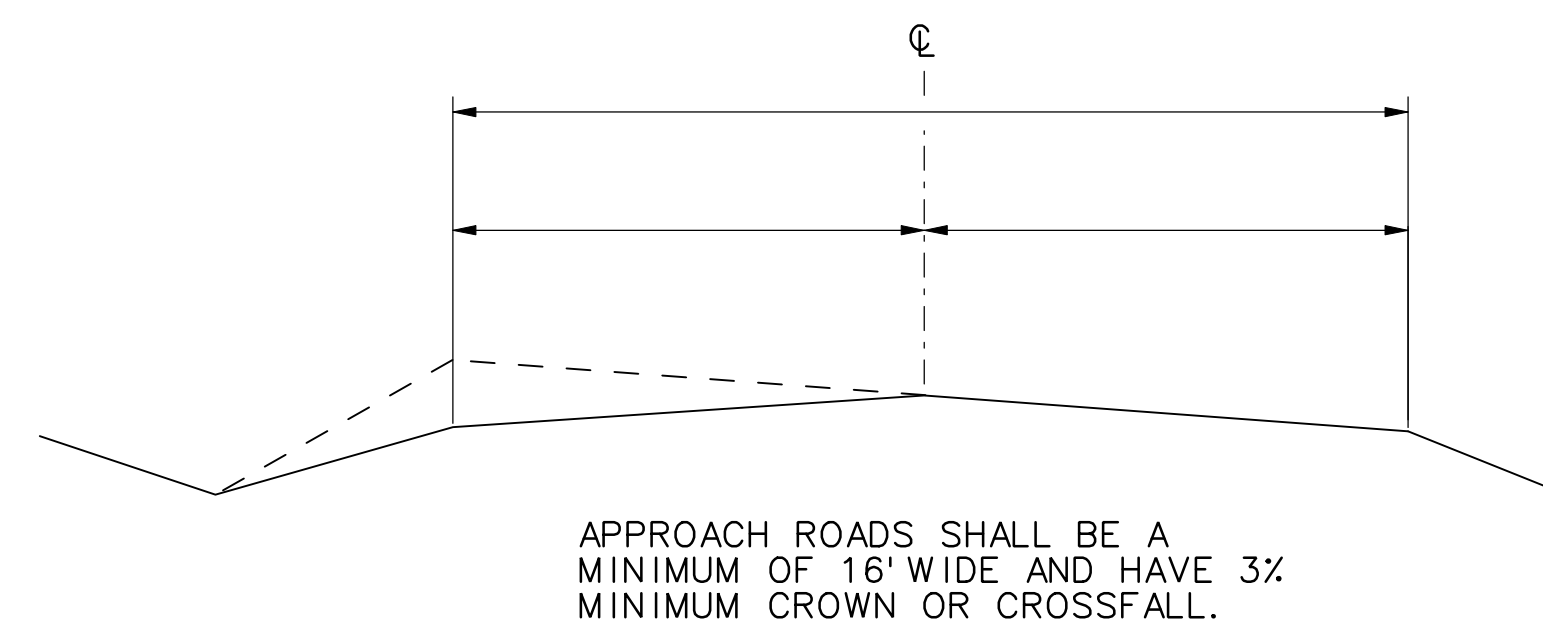
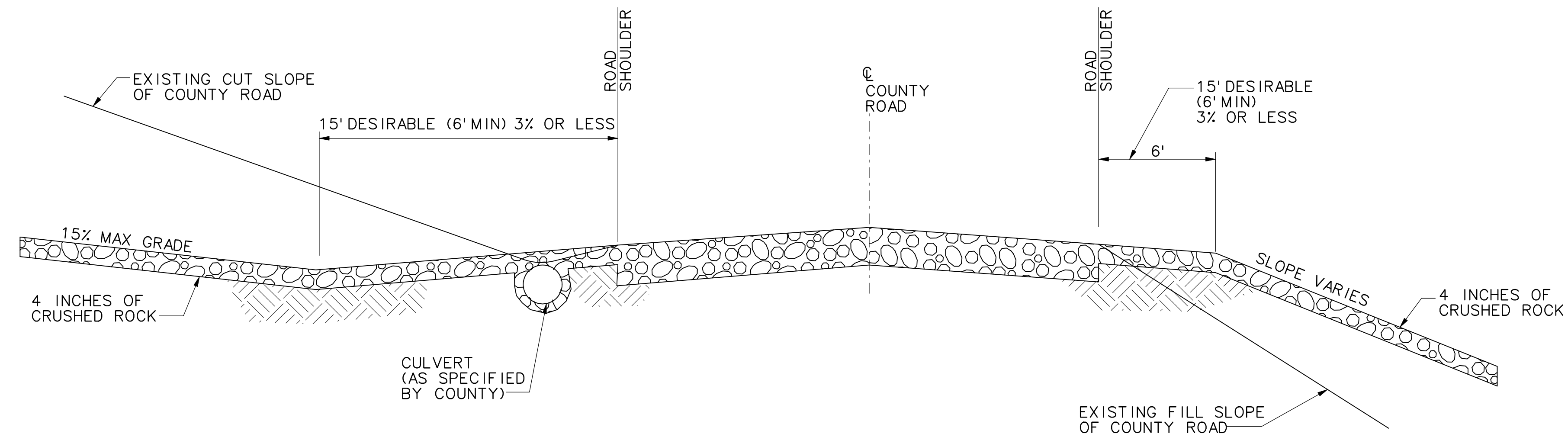


TYPICAL SECTION
NTS

KLICKITAT COUNTY DRIVEWAY APPROACH

DRAWING NUMBER	SHEET	TITLE
REFERENCE DRAWINGS		

NO.	*C	W.O.	00232575	COMPUTER REVISION ONLY			BY	DATE	APPROVED
* C=CONTRACT CONSTRUCTION				,FA=FORCE ACCOUNT CONSTRUCTION ,R=RECORD					
Design	HDR/MHT			UNITED STATES DEPARTMENT OF ENERGY BONNEVILLE POWER ADMINISTRATION HEADQUARTERS, PORTLAND, OREGON BIG EDDY-KNIGHT NO.1 500kv TRANSMISSION LINE PROJECT KLICKITAT CO.DRIVEWAY APPROACH DETAIL					
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Chkd	HDR/DEC								
Sub									
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Appr									
Date	JULY 2011			SERIAL	SOURCE	SIZE	SHEET	REVISION	
	290778			LFC	A1	62	0		

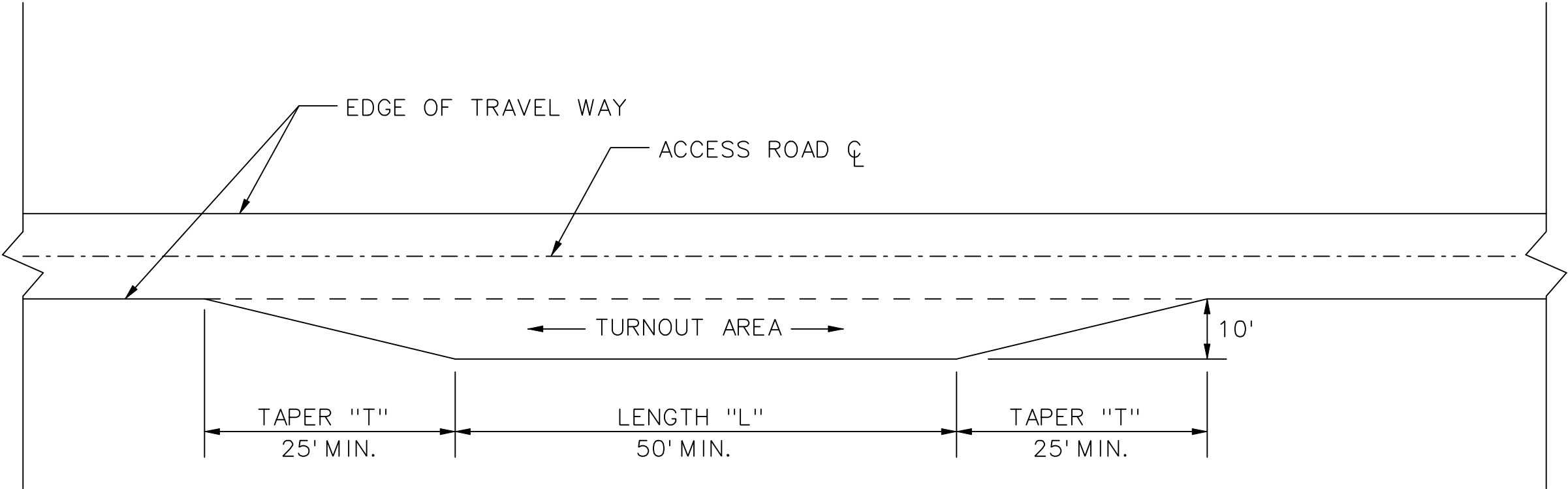


WASCO COUNTY APPROACH STANDARDS NTS

DRAWING NUMBER	SHEET	TITLE
		REFERENCE DRAWINGS

NO.	*C	W.O.	COMPUTER REVISION ONLY	BY	DATE	APPROVED
		00232575				
* C=CONTRACT CONSTRUCTION ,FA=FORCE ACCOUNT CONSTRUCTION ,R=RECORD						
Design	HDR/MHT					
Drawn	HDR/LBM					
Chkd	HDR/DEC					
Sub						
Rec						
Rec						
Appr						
Date	JULY 2011					
SERIAL			SOURCE	SIZE	SHEET	REVISION
290778			LFC	A1	63	0

UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
 HEADQUARTERS, PORTLAND, OREGON
BIG EDDY-KNIGHT NO.1
500kv TRANSMISSION LINE
PROJECT
WASCO CO. DRIVEWAY APPROACH
DETAIL



VEHICLE TURNOUT DETAIL
NTS

- NOTES:
- 1. TURNOUT AREA SURFACING TO MATCH ROAD CROSS SECTION TYPICAL DETAIL.
 - 2. PLACE VEHICLE TURNOUTS AT A MINIMUM OF 1/4 MILE INCREMENTS ALONG AN ACCESS ROAD ALIGNMENT, PER BPA STANDARDS

DRAWING NUMBER	SHEET	TITLE
REFERENCE DRAWINGS		

NO.	*C	W.O. 00232575	COMPUTER REVISION ONLY			BY	DATE	APPROVED
* C=CONTRACT CONSTRUCTION ,FA=FORCE ACCOUNT CONSTRUCTION ,R=RECORD								
Design	HDR/JRS		UNITED STATES DEPARTMENT OF ENERGY BONNEVILLE POWER ADMINISTRATION HEADQUARTERS, PORTLAND, OREGON BIGEDDY-KNIGHT NO.1 500 kv TRANSMISSION LINE PROJECT VEHICLE TURNOUT DETAIL					
Drawn	HDR/CCW							
Chkd	HDR/DEC							
Sub								
Rec								
Rec								
Appr								
Date	JULY 2011		SERIAL	SOURCE	SIZE	SHEET	REVISION	
			290778	LFC	A1	64	0	